Belarus

500 Series Tractors
800 Series Tractors
900 Series Tractors

Operators Manual

DO NOT use or operate this tractor until this manual has been read and fully understood.

Belarus Machinery Inc.
P.O. Box 23608
7075 West Parkland Court
Milwaukee, WI 53223

IMPORTANT

If This Tractor Is Used By An Employee Or Is Loaned Or Rented, Make Certain That The Operator(s), Prior to Operating:

1. **Is Instructed In Safe and Proper Use.**
2. **Reviews and Understands This Manual Pertaining to the Tractor.**

NOTICE

Because of design changes that may occur in the tractor since this manual was printed, it is possible that some pictures and/or illustrations found within this manual may be different from those found on the product; however, the technical information found within this manual was correct at the time this manual was approved for publication.

If any information contained in this publication is not understood, the user should contact his Belarus Dealer for assistance.

To the Owner of a Belarus Tractor

Practical experience is the key to the successful design and manufacture of your new Belarus tractor. For many years Belarus tractors have been operating in all types of conditions in many parts of the world. However, any product will only be as good as the care and service that is provided by the end user.

Use this manual as your guide. If you follow the instructions given in this manual, your Belarus tractor will work well for many years.

This Operators Manual covers the following 500, 800, and 900 Series Belarus tractor models. These tractor models are all similar in appearance and have many common components and features. The tractors may be 2-wheel drive (2WD) or mechanical assist front wheel drive (MFD).

Model	Type	
505	2WD	Four Post ROPS Canopy (optional)
525	MFD	Four Post ROPS Canopy (optional)
560	2WD	ROPS Cab
562	MFD	ROPS Cab
570	2WD	ROPS Cab
572	MFD	ROPS Cab
800	2WD	Four Post ROPS Canopy (optional)
802	2WD	ROPS Cab
805	2WD	ROPS Cab
820	MFD	Four Post ROPS Canopy (optional)
822	MFD	ROPS Cab
825	MFD	ROPS Cab
900	2WD	Four Post ROPS Canopy (optional)
902	2WD	ROPS Cab
905	2WD	ROPS Cab
920	MFD	Four Post ROPS Canopy (optional)
922	MFD	ROPS Cab
925	MFD	ROPS Cab

NOTE: *The letter "M" following the numerical model designation (example: 505M) will indicate one or more variations or modifications within the same tractor model.*

The following are examples of variations or modifications that may differ within the same tractor models in equipment or component configuration:

- Instrument Cluster (Steel or moulded plastic)
- Starting System (12 or 24 volt DC)
- Engine (Direct Injection or Pre-Combustion)
- Steering System (Hydrostatic assist unit located under dash or ahead of radiator)
- Gear Box (with or without speed reducer)

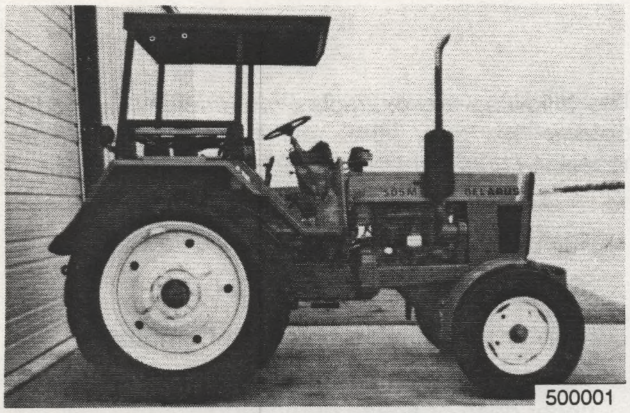
Because your tractor could have one or all of the variations or modifications listed, it will be extremely important to know and record your tractor model, tractor serial number and engine serial number when requesting information or assistance when referring to the tractor or when it is necessary to order replacement parts.

Use only genuine replacement parts for your tractor. Write the model and serial numbers of your tractor on the lines provided.

Your local Belarus dealer can give you assistance with Belarus made parts and persons with special training that have the equipment and know the best methods of repair and maintenance for your tractor.

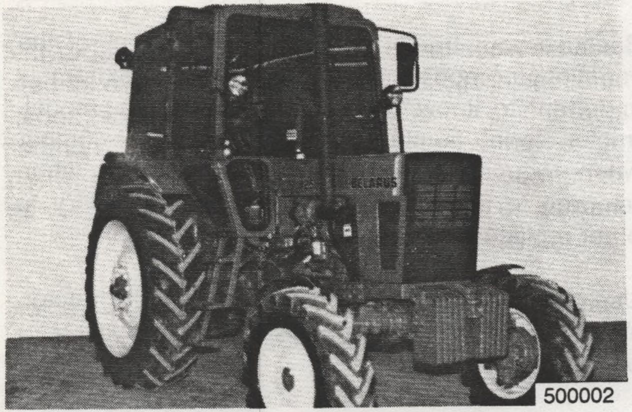
Call your dealer if you need any assistance or require additional information.

Introduction



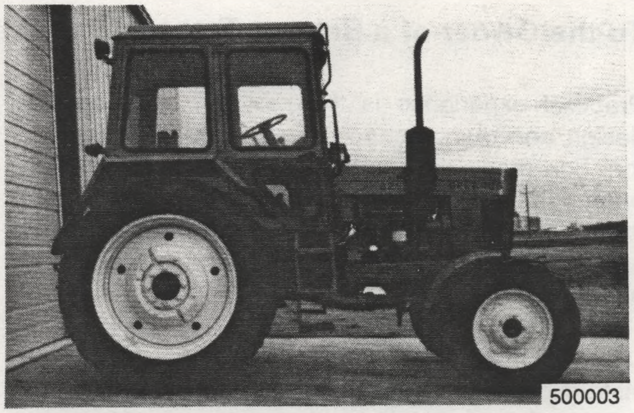
500001

Model 505M Tractor



500002

Model 925 Tractor



500003

Model 825 Tractor

NOTE: *All reference made to the tractor right hand side, or left hand side will be the same as your right hand or left hand when seated in the operators seat looking forward.*

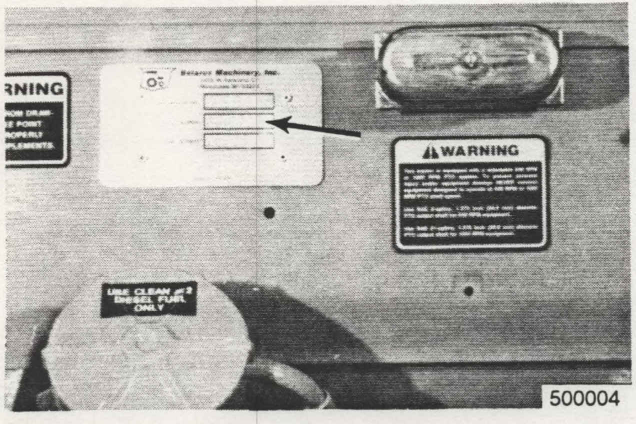
Serial Numbers and Locations

Tractor Model Identification ________________

Tractor Serial Number ________________

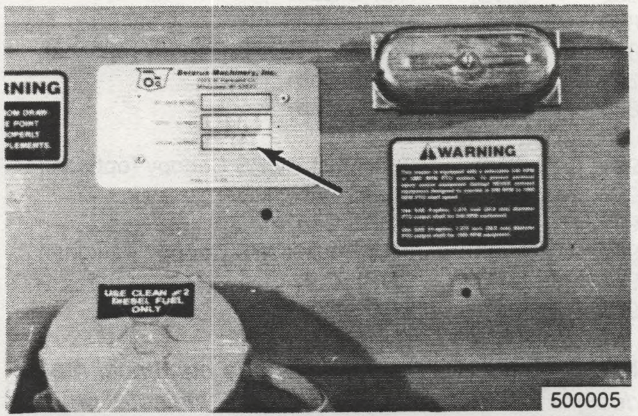
Engine Serial Number ________________

Date Purchased ________________

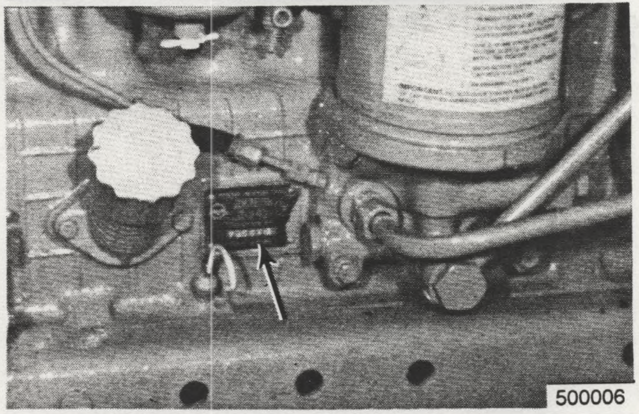


500004

Tractor Serial Number Location



500005



500006

Engine Serial Number Location

BELARUS MACHINERY OF USA, INC.
NEW TRACTOR WARRANTY

WHAT IS WARRANTED AND FOR HOW LONG?

Belarus Machinery of USA, Inc. warrants to the first owner of each new Belarus wheeled agricultural tractor that for a period of twelve (12) months or one thousand (1000) hours, whichever occurs first, it will repair or replace all parts of the tractor, except batteries and tires that are defective in material or workmanship. Batteries are supplied with the tractor at no charge to the customer. Tires are covered by a separate thirty-six (36) month prorated warranty.

This warranty is in effect only if the tractor has been properly registered for warranty by the retailing authorized Belarus dealer completing the End User Certificate and forwarding such certificate to Belarus Machinery of USA, Inc. and provided the Mandatory New Tractor 60 Hour Dealer Maintenance service has been carried out and the Mandatory 60 Hour Maintenance Certificate forwarded by the servicing Belarus dealer to Belarus Machinery of USA. Inc.

The non-transferable twelve (12) month (1000) hour new tractor warranty and the thirty-six (36) month tire warranty period shall begin on the date the tractor is delivered to the first retail purchaser.

The New Tractor Warranty is for the exclusive benefit of the purchaser and is not assignable or transferable. Repair or replacement of parts or tires is conditional upon the Belarus Dealer completing, and the purchaser signing, the manufacturer's standard warranty form current at the time of adjustment.

TIRE WARRANTY

Manufacturer's tires are guaranteed to the original owner to be free from defects in material and/or workmanship for thirty-six (36) months. Excluded from this warranty is injury from cuts, impact breaks by encountered field hazards or vehicle or implement obstruction, tires willfully abused, damaged or destroyed by fire or theft, tires used for logging, pulling contests, run underflated, punctured by nails, or whose beads have been kinked or broken.

In the event any manufacturer's tractor tire is rendered unserviceable because of defects in material and/or workmanship, the manufacturer will, at its option, repair the tire at no charge or will replace the tire with a new tire of like quality and size on payment by the purchaser of the following prorated portion of the manufacturer's price for the replacement tire current at the time of adjustment.

PURCHASER TO PAY THE FOLLOWING PERCENTAGE OF BELARUS MACHINERY OF USA, INC. SUGGESTED TIRE LIST PRICE, PLUS APPLICABLE TAXES.

TIME IN SERVICE	PERCENTAGE RATE
0 - 12 months	No charge
12 - 24 months	25%
24 - 36 months	75%

WHAT IS NOT COVERED BY THE WARRANTY?

This warranty does not apply to:

1. Batteries - batteries are supplied with a new tractor at no charge to the customer.
2. Conditions resulting from misuse, abuse, negligence, alterations, accidents, or lack of performance of required maintenance service.
3. Repair required due to lack of proper storage protection, depreciation, or wear due to normal use.
4. Maintenance service and replacement of maintenance items (such as oil changes, replacement of belts, hoses and brake lining and/or adjustments to belts, clutches and brakes), made in conjunction with normal maintenance service.
5. Loss of time, inconvenience, loss of use of the tractor or other consequential damages.
6. A used Belarus tractor or a tractor in second ownership.
7. A tractor which has been altered and/or modified without the approval of **Belarus Machinery of USA, Inc.**
8. A tractor that has been equipped with attachments which have not been approved by **Belarus Machinery of USA, Inc.**

OWNER/USER RESPONSIBILITY

1. It is the responsibility of the owner/user to read the Operator's Manual and understand the safe and correct operating procedures pertaining to the operation of the tractor.
2. The owner/user is responsible for performance of normal servicing as set forth in the Operator's manual and further responsible for the timely performance of the new tractor mandatory 60 hour dealer service. The owner should not be charged for the new tractor mandatory 60 hour service, but is expected to pay for fluids, filters, light bulbs and adjustments considered normal maintenance and not covered by warranty as further detailed in the warranty statement portion **"What is not covered by the Warranty"**.
3. The owner/user is responsible for inspecting his machine daily, and for having parts repaired or replaced when continued use of the tractor would cause damage or excessive wear to other related parts or otherwise make the tractor unsafe.
4. The owner is responsible for delivery of the tractor to an authorized **Belarus Dealers** place of business during regular business hours for performance of warranty required service and warranty repair.

   If the Dealer is requested by the owner to travel to another location, or haul the tractor to his shop for the purpose of performing a maintenance service or warranty repair, it would be for the owners convenience, and the cost of such trips is to be paid by the owner. Any arrangements whereby the Dealer agrees to absorb all or part of the cost of such trips is to be made between the Dealer and Owner and is to be considered a courtesy to the Owner. **Belarus Machinery** does not allow credit for the cost of travel time, mileage, or hauling as a warranty allowance.
5. When requesting warranty service, the Owner must present evidence of the date of the new tractor delivery and performance of the mandatory 60 hour maintenance service.
6. The Owner is responsible for complience with the requirements as set forth in the **Belarus Machinery of USA, Inc. New Tractor Warranty policy.**

Continues

NEW TRACTOR WARRANTY
(Continued)

BELARUS DEALER RESPONSIBILITY

1. Qualifying warranty repairs will be performed by any Belarus Dealer within a reasonable time following Owner notification and/or delivery of the tractor to the Dealer's place of business.
2. Repair qualifying for warranty will be performed for the Owner without charge for parts and labor by the servicing Belarus Dealer with the exception being those parts and that service previously stated as normal maintenance and therefore the costs are reimbursable to the Dealer by the owner.

WARRANTY LIMITATION

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTY, EXPRESSED OR IMPLIED, (INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND CONSTITUTES THE ONLY WARRANTY MADE BY BELARUS MACHINERY OF USA, INC. NO OTHER WARRANTY IS MADE OR AUTHORIZED TO BE MADE OTHER THAN AS HEREIN SET FORTH.

IN NO EVENT SHALL THE DEALERS LIABILITY OR THE LIABILITY OF BELARUS MACHINERY OF USA, INC. ON ANY EXPRESSED OR IMPLIED WARRANTY EXCEED THE COST OF REPLACEMENT, AT THE DEALERS PLACE OF BUSINESS, OF PARTS FOUND TO BE DEFECTIVE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

BELARUS MACHINERY OF USA, INC. and/or the manufacturer, reserves the right to make changes or improvements in design and/or specifications to products manufactured or sold by them at any time without notification or incurring any obligation to make the same or similar changes on products previously manufactured and/or sold.

New Tractor 60 Hour/90 Day Mandatory Service Requirement

Your new tractor "break-in" period requires some maintenance intervals to differ from the normal scheduled maintenance requirements.

The first 60 hour or 90 day (whichever occurs first) mandatory service procedures are necessary in order to flush out any contamination or other particles that may accumulate in the various systems of the tractor during the "run-in" process which cannot be done during the machine process.

After the first 60 engine operating hours or 90 days, whichever occurs first, you must contact your selling Belarus dealer to make arrangements to have this mandatory service performed. This service is free of charge when performed by the selling dealer, except for materials, fluids, filters, grease, etc. replaced as part of the normal maintenance requirements as stated in the New Tractor Warranty Policy. Timely performance of this Mandatory 60 Hour/90 Day Service will help ensure the long life built into your new tractor.

The owner is responsible to contact his selling Belarus dealer to set up a service appointment and for bringing the tractor to the selling Belarus dealer's shop to have this service performed. Failure to have this mandatory service performed in a timely fashion will result in cancellation of warranty.

If the 60 Hour/90 Day Mandatory Service is performed by anyone other than the selling dealer, the cost of this service must be paid by the end user.

Belarus Machinery, Inc. does not allow credit for the cost of travel time, mileage, or hauling as a warranty allowance.

If the owner requests the dealer to perform warranty obligations or inspections at locations other than the dealers service shop, travel costs to such locations are usually paid by the tractor owner. Arrangements for travel costs and service performed at locations other than the dealer shop should be agreed upon at the time of the service request. Read your "New Tractor Warranty" carefully for a complete understanding of what is and what is not warrantable.

Your Belarus dealer performing the 60 Hour/90 Day Service must complete the three part New Tractor Mandatory 60 Hour/90 Day Service form included in this manual. This form must be signed and dated by both the servicing dealer and the owner/user at the time the service is performed. **One copy must be mailed to Belarus Machinery, Inc. Warranty Department** to validate the warranty. One copy is for the dealer file and one copy remains in the Operators Manual for the owners record.

IMPORTANT: *Setting engine fuel delivery above factory specifications or otherwise overpowering the tractor will void the warranty.*

RETAIL PURCHASE ORDER AND END USER CERTIFICATE FOR BELARUS FARM EQUIPMENT

BUYER ______________________

ADDRESS [redacted]

CITY [redacted] STATE ______ ZIP [redacted]

SELLER ______________________

ADDRESS [redacted]

CITY [redacted] STATE ______ ZIP [redacted]

PHONE [redacted] COUNTY [redacted]

I hereby order from you, subject to all terms, conditions and agreements contained herein and the ADDITIONAL PROVISIONS on the REVERSE hereof,
Delivery to be made at ______________________ on or about ______________ 19___, the following.

QUANTITY				SERIAL	SERIAL	CASH
NEW	USED	MODEL	DESCRIPTION	NUMBER	NUMBER	PRICE
		[redacted]		[redacted]	[redacted]	

CASH PRICE (TOTAL)	
CASH DOWN PAYMENT (WITH ORDER)	
TRADE-IN (NET ALLOWANCE)	
TOTAL DOWN PAYMENT	
UNPAID BALANCE OF CASH	
OTHER CHARGES: OFFICIAL FEES	
SALES OR USE TAX	
BALANCE DUE	

DESCRIPTION OF TRADE-IN

Buyer hereby represents and certifies that Buyer owns the trade-in described herein free and clear of all liens and encumbrances.

SIGNED ______________________

I/We promise to pay the Balance Due as shown above in cash, or to execute a retail installment contract for the purchase price of the equipment, plus additional charges shown therein, on or before delivery of the equipment ordered herein.

SIGNATURE OF BUYER [redacted]

ACCEPTED By FOR SELLER [redacted]

SELLER Title ______________________

CUSTOMER COPY

CONDITIONS OF SALE

1. Buyer agrees that title to the equipment delivered under this Retail Purchase Order shall remain at Seller until Seller has received payment in full.
2. Seller shall not be liable for failure to deliver or delays in delivery resulting from strikes or other labor troubles, material or labor shortages, direct or indirect acts of government, priorities established by government, voluntary or compulsory curtailment of the manufacturer's production, fires, floods, stoppages in transit, embargoes, acts of God or the public enemy, war sabotage, or any cause beyond Seller's control. Belarus Machinery of U.S.A., Inc. ("Belarus") shall not be under any liability whatsoever to Buyer for failure to deliver, or for delay in making delivery, if such failure or delay results from any event whether foreseen or foreseeable or not, brought about by causes other than willful or gross negligent conduct of Belarus, such as an event in the nature of force majeure, acts of God, foreign or civil wars, riots, interruptions of navigation, shipwrecks, strikes, other labor troubles, embargoes or other governmental acts, authority, regulation or request, blockades, fires, theft, explosions, failure of the manufacturer or of any other supplier of, Belarus to delivery, or delays of the manufacturer or of any other supplier of Belarus in making delivery, or voluntary or compulsory curtailment of production.
3. If Buyer fails satisfactorily to settle for the items ordered within five (5) days after Buyer has been notified that they are ready for delivery, Seller may cancel this Order and retain the cash downpayment and retain or sell the used equipment taken in exchange as part payment of the purchase price or at Seller's option, as Seller's liquidated damages.
4. Buyer will accept the items ordered with such changes in design, materials, and/or specifications as the manufacturer may make certain therein, but Seller shall not be obligated to incorporate in the items ordered any changes in design, materials and/or specifications made by the manufacturer in similar items.
5. It is agreed that the Seller's interest in this Order be assigned by the Seller. This Order is not assignable by Buyer without Seller's prior written consent.
6. Buyer acknowledges receipt of a copy of this Order which is understood to be the entire contract relating to the sale and warranty of the equipment described herein, excepting as to any security agreements, notes, conditional sales or retail installment contracts, or chattel mortgages entered into as herein contemplated if the purchase price is to be financed. No representations, promises, or statements have been made by Seller unless endorsed herein in writing.
7. WARRANTIES:
   USED MACHINERY: Each USED item of equipment covered by this Order is sold AS IS, WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED.
   NEW BELARUS MACHINERY: To the extent not prohibited by law, Belarus gives Buyer the warranty set forth in the warranty provisions of the Belarus Machinery, Inc. Warranty Service Manual (a copy of which is either provided with the equipment or available to Buyer upon request) AND NO OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE: Any description of the goods, whether in writing or made orally by Seller or Belarus or their agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets or similar materials used in connection with the sale evidenced hereby are for the sole purpose of identifying the goods and shall not be construed as an express warranty: and any suggestions by Seller or Belarus or their agents regarding use, application or suitability of the goods shall not be construed as an express warranty.
8. CONSEQUENTIAL DAMAGES: To the extent not prohibited by law, Belarus' liability with respect to items proved to Belarus' satisfaction to fail to comply with Belarus' warranty shall be repair, replacement or adjustment of the purchase price as provided in Paragraph 7 above, and in no event shall Belarus' liability exceed the purchase price of the goods sold; and Belarus shall not be subject to any other obligations or liabilities whatsoever, whether based on contract, tort or other theories of law, with respect to goods or services furnished by it, or any undertakings, acts or omissions relating thereto, including, without limitation, property or personal injury damages, penalties, special or punitive damages, damages for lost profits, shut-downs, slow-downs, or for other types of economic loss. To the extent not prohibited by law, BELARUS SPECIFICALLY DISCLAIMS ALL CONSEQUENTIAL, INCIDENTAL AND CONTINGENT DAMAGES WHATSOEVER.
9. To the extent not prohibited by law, the invalidity of any provision of this Order shall not affect the validity of any other provision.
10. INSERT SPECIFIC LAWS THAT APPLY TO YOUR STATE THAT ARE NOT COVERED HEREIN:

Belarus Machinery, Inc.

Dealer Pre-Delivery Service and End User Certificate

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery in order for the warranty to be valid. Use typewriter or pen and press firmly.

OWNER ________________________

ADDRESS ________________________

CITY____________COUNTY ____________

STATE________ZIP CODE ____________

TELEPHONE NO.________________________

DEALER ________________________

ADDRESS ________________________

CITY____________STATE______ZIP ____________

MODEL____________HOURS ____________

S/N____________ENGINE NO.____________

ACCESSORES ( ) LOADER S/N ____________

( ) ROPS S/N ____________

( ) OTHER LISTED BELOW

____

INSPECTION PERFORMED BY:

____

INSPECT, CHECK AND/OR ADJUST THE FOLLOWING ITEMS AS REQUIRED. REFERENCE THE TRACTOR OPERATOR MANUAL FOR INFORMATION REGARDING SPECIFICATIONS, CAPACITITES, FLUID RECOMMENDATIONS, LUBE POINTS AND OTHER SERVICE INFORMATION.

( ) Remove fluid reservoir drain plugs to check and drain water condensation and sediment. tighten the plugs.

( ) Lubricate fuel filler cap threads and seal. Check fuel in tank (at least 10 gallons)

( ) Drain sediment from primary and secondary fuel filters.

( ) Drain fuel injection pump housing sump. Refill with new engine oil of the specified type.

( ) Check engine crankcase oil level.

( ) Check engine air induction system including air filter oil bath sump.

( ) Check air cooled engine for blower restriction plate, remove plate in warmer ambient temperatures.

( ) Check engine coolant level and freeze point (water cooled engines)

( ) Check transmission oil level.

( ) Check both rear final drive oil levels.

( ) Check front drive differential oil level (if MFD equipped).

( ) Check both front final drive (and intermediate level gear boxes) oil levels (If MFD equipped).

( ) Check front wheel bearing lubrication (2-wheel drive)

( ) Check hydraulic steering tank oil level (if equipped).

( ) Check all hydraulic and fuel line routings for chafing.

( ) Check hydraulic system fluid level.

( ) Check 3-Pt hitch dash control handle and side quadrant lever for proper operation (if draft/position control equipped).

( ) Check draft control and response levers for free movement (if equipped).

( ) Check 3-Pt hitch cylinder mounting bolts.

( ) Check oil level in hydraulic pump drive gear box.

( ) Grease all pressure lube grease fittings.

( ) Check and adjust tire pressures.

( ) Torque all wheel lug bolts and nuts.

( ) Check diff lock pedal operation.

( ) Check and/or adjust clutch pedal free travel and transmission interlock system.

( ) Check and/or adjust brake pedal free travel.

( ) Check all electrical system cables and wire routings.

( ) Check operators seat and seat belt operation.

( ) Check operation of all gauges, lights, and switches.

( ) Adjust the headlights.

( ) Clean all starter and battery terminals. Check battery electrolyte level.

( ) Clean ground lockout switch mounting bolt area to ensure positive ground connection.

( ) Check and ensure all chassis and ROPS fasteners are complete and tight.

( ) Clean and/or change hydraulic system filter.

REQUIRED OPERATION SERVICE CHECKS

( ) Starter and starter neutral safety switch function.

( ) Engine low idle speed check.

( ) Engine high idle (no load) speed check.

( ) Hand and foot throttle operation.

( ) All instruments and gauges operational.

( ) Engine oil pressure and temperature check.

( ) Steering function and toe-in.

( ) Transmission range shift lever function.

( ) Transmission mode shift lever function.

( ) Remote hydraulic control valve operation.

( ) Three Point Hitch and control levers/valve function.

( ) Hydraulic pump engage/disengage.

( ) Check hydraulic and power steering system pressures.

( ) PTO system engage/disengage.

( ) Hand brake operation.

( ) Check and repair all fluid leaks.

REQUIRED PERFORMANCE CHECKS

( ) Transmission and clutch operation.

( ) Differential Lock Operation.

( ) Wheel brake operation.

( ) Engine operation including governor operation.

( ) All optional equipment and/or accessories.

( ) Run on Dyno at 50% load for 2 hours.

OTHER

( ) Clean tractor and touch-up paint.

( ) Deliver Operator Manual to buyer. Review Operator Manual content with buyer and instruct buyer on machine care, function, adjustments, and safe operation. The Warranty Policy provisions and owners responsibility were also explained and reviewed.

Above tractor and Operators Manual has been delivered to me in good condition and I have been thoroughly instructed in the care, function, safe operation, adjustments and warranty policy provisions.

BUYERS SIGNATURE________________________DATE________

I have delivered tractor S/N____________ and Operators Manual to the above customer and have instructed him in the care, function, safe operation, adjustments, and explained the applicable warranty policy provisions.

AUTHORIZED DEALER SIGNATURE________________________DATE________

BELARUS MACHINERY, INC.
P.O. Box 23608
7075 West Parkland Court
Milwaukee, WI 53223

CUSTOMER COPY

USE CARBON - PRINT CLEARLY

BELARUS MACHINERY, INC.

P.O. BOX 23608, MILWAUKEE, WISCONSIN 53223

MANDATORY 60 HOUR/90 DAY DEALER SERVICE

This three part form must be filled out by the dealer and signed by the customer at the time the 60 Hour Mandatory Service is performed in order for the warranty to be valid. Send FACTORY COPY to: Belarus Machinery, Inc. Warranty Department.

OWNER NAME			DEALER NAME		
ADDRESS			ADDRESS		
CITY	COUNTY	STATE	CITY	COUNTY	STATE
TELEPHONE NO.		ZIP CODE	DEALER I.D.		ZIP CODE
TRACTOR MODEL NO.		TRACTOR S/N	HOURMETER HOURS		
ENGINE MODEL		ENGINE S/N	DATE SERVICED		

NOTE: Record Serial Numbers Directly From Tractor

REQUIRED INOPERATIVE SERVICE CHECKS

( ) Change engine crankcase oil.
( ) Change engine fuel injection pump oil.
( ) Drain and clean centrifugal oil filter or change element.
( ) Check engine head bolt torque. (except 250/310)
( ) Check engine valve clearance.
( ) Check engine fuel injector crack pressure and spray pattern.
( ) Drain sediment from primary fuel filter.
( ) Drain sediment from fuel tank.
( ) Check engine air induction system tightness.
( ) Check exhaust manifold and muffler tightness.
( ) Check fan belt tension.
( ) Remove engine air distribution shroud. Clean all cooling fins, fan and intake screen of debris.
( ) Change hydraulic oil. Clean or change filter.
( ) Change hydraulic pump drive oil. (except 310)
( ) Clean filter and breather of hydraulic steering tank.
( ) Change transmission gear box oil.
( ) Change rear final drive housing oil.
( ) Check and/or adjust clutch linkage and transmission interlock system
( ) Check and/or adjust brakes.
( ) Check wheel and hub nut torque.
( ) Check tire condition and inflation pressure.
( ) Check battery water level, cables tight and clean.
( ) Grease all lube fittings.
( ) Front wheel bearing lubrication.
( ) Check all electrical cables and wire routings keeping away from sharp edges, moving parts and exhaust heat.
( ) Check operators seat and seat belt operation.
( ) Check operation of all gauges, lights and switches.
( ) Check paint and decals.
( ) Check and ensure all fasteners are complete and tight.
( ) Wash and clean tractor.

REQUIRED OPERATIONAL SERVICE CHECKS

Perform with tractor at normal operating temperature.

( ) Engine oil pressure and temperature check.
( ) Engine low idle speed. (Check)
( ) Engine high idle speed. (Check)
( ) Hand and foot throttle operation.
( ) All instruments and gauges operational.
( ) Starter
( ) Steering function.
( ) Transmission shift lever operation.
( ) Hydraulic control valve operation.
( ) Wheel and park brake operation.
( ) Fluid leaks.
( ) PTO engagement and disengagement.
( ) Three-Point Hitch function.

REQUIRED PERFORMANCE CHECK

( ) Transmission and clutch operation.
( ) Differential lock operation.
( ) Wheel brake operation.
( ) Engine operation including throttle and governor operation.
( ) All optional equipment and/or accessories.

MECHANICAL FRONT DRIVE (MFD) (if equipped)

( ) Change front differential oil
( ) Change final drive oil
( ) Grease axle shaft u-joints and king pin bushings

Dealer Comments ______________________________

____

Dealer Signature ______________________________ **Date** ______________

Owner's Signature ______________________________ **Date** ______________

IMPORTANT: Failure to perform the 60 Hour/90 Day Mandatory Service results in cancellation of warranty. If the 60 Hour/90 Day Mandatory Service is performed by anyone other than the selling dealer, the cost must be paid by the end user.

Customer Copy

BELARUS MACHINERY, INC.

NOTICE OF ROPS PROTECTION

OSHA, Part 1928 "Occupational Safety and Health Standards For Agriculture". Subpart C, Paragraph b, Subparagraph 1 states:

> "...A roll-over protective structure (ROPS) shall be provided by the employer for each tractor operated by an employee..."

The cost, availability and advisability of ROPS protection have been explained to me.

I have considered this option and, with full knowledge, (✓) accept/ ( ) decline ROPS protection. (check appropriate box)

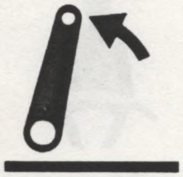
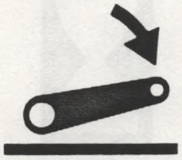
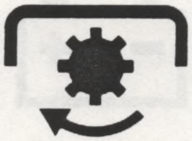
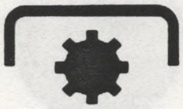
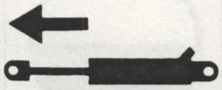
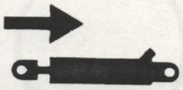
Dated this ______day of ________________, 19___

____
Signature of customer

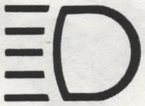
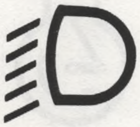
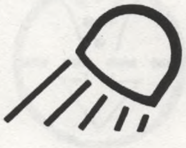
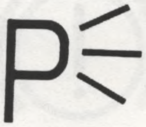
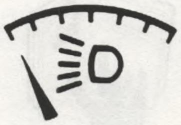
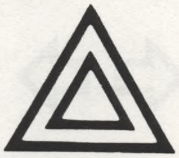
CUSTOMER COPY

INTERNATIONAL SYMBOLS

SYMBOLS FOR PRIMARY CONTROLS

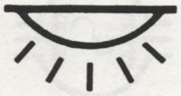
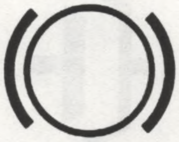
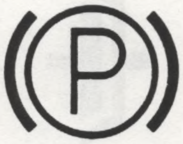
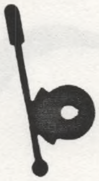
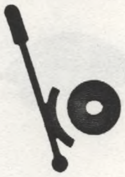
Rockshaft Up	Rockshaft Down	Power Take-Off (On)	Power Take-Off (Off)	Remote Cyl Extend	Remote Cyl Retract
					

SYMBOLS FOR SECONDARY CONTROLS – LIGHTS

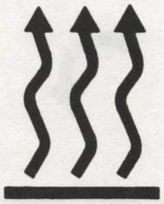
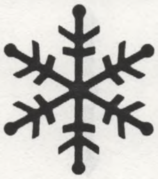
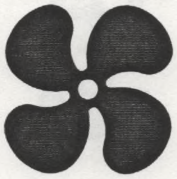
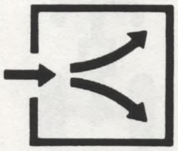
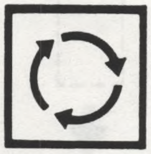
Headlight Upper Beam	Headlight Lower Beam	Work Light	Park Light	Instrument Light	Emergency Light
					

LIGHTS (CONTINUED)

BRAKES

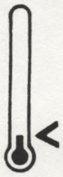
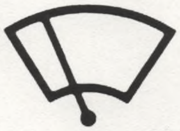
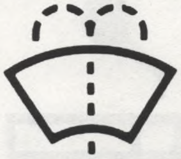
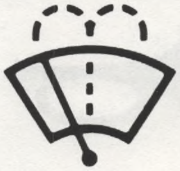
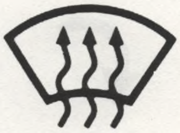
Dome Light		Brake	Parking Brake	Hand Brake Engage	Hand Brake Disengage
					

CLIMATE CONTROL

Heater	Air Conditioning	Ventilating Fan	Outside Air Circulation	Inside Air Circulation	Temperature Hot
					

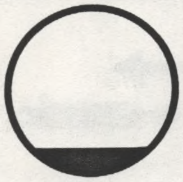
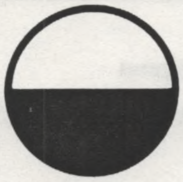
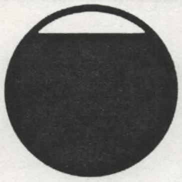
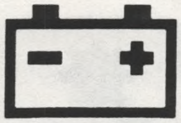
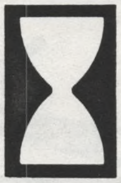
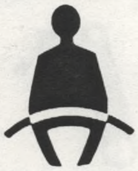
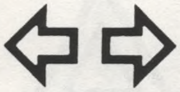
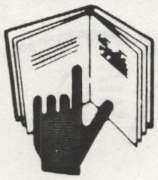
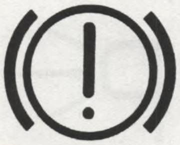
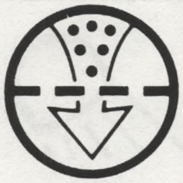
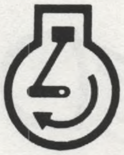
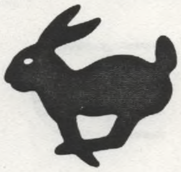
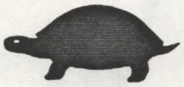
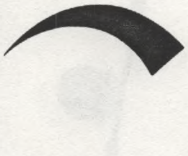
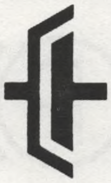
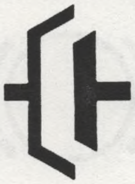
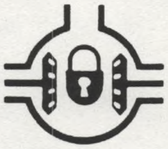
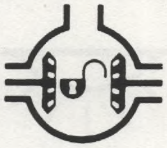
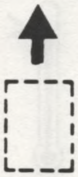
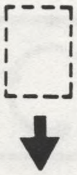
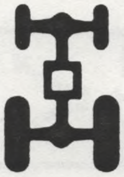
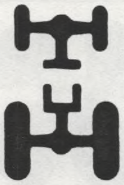
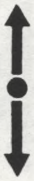
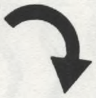
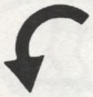
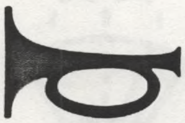
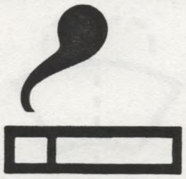
CLIMATE CONTROL (CONTINUED)

WINDOWS

Temperature Cold		Windshield Wiper	Windshield Washer	Washer and Wiper	Windshield Defroster
					

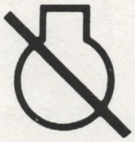
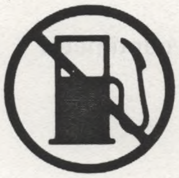
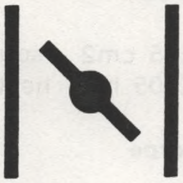
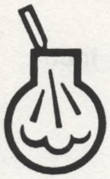
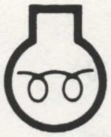
INTERNATIONAL SYMBOLS

GENERAL

Volume Empty	**Volume Half-Full**	**Volume Full**	**Battery**	**Hourmeter**	**Seatbelt**
					
Turn Signal	**Read Oper Manual**	**Brake Failure**	**Air Filter**	**Engine Speed**	**Fast**
					
Slow	**Continuously Variable**	**Clutch Engage**	**Clutch Disengage**	**Differential Lock**	**Diff Lock Disengage**
					
Machine Travel Direction - Forward	**Machine Travel**	**Axle Connect**	**Axle Disconnect**	**Control Lever Operating Direction**	**Clockwise Rotation**
					
Counterclokwise Rotation	**Horn**	**Lighter**			
					

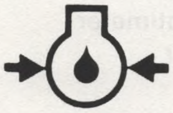
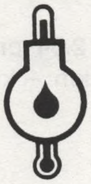
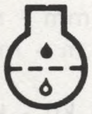
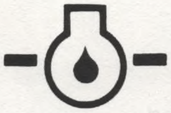
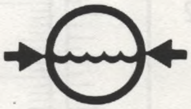
SAE SYMBOLS FOR CONTROLS, INDICATORS AND TELL-TALES

ENGINE

Engine Stop	Fuel Shut-Off	Choke	Ether Injection	Electrical Preheat	
					

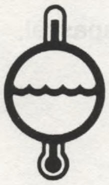
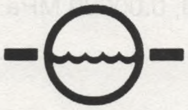
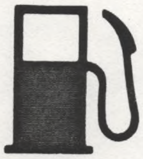
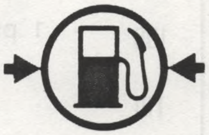
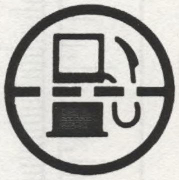
ENGINE OIL

COOLANT

Pressure	Temperature	Filter	Level		Pressure
					

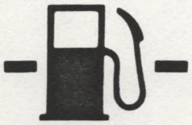
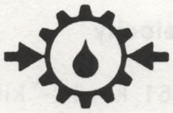
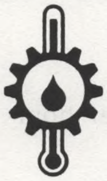
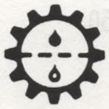
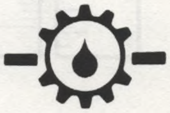
COOLANT (CONTINUED)

FUEL

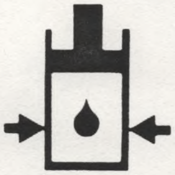
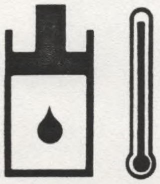
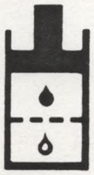
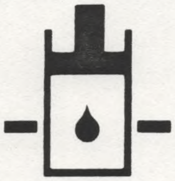
Temperature	Level		Fuel	Pressure	Filter
					

FUEL (CONTINUED)

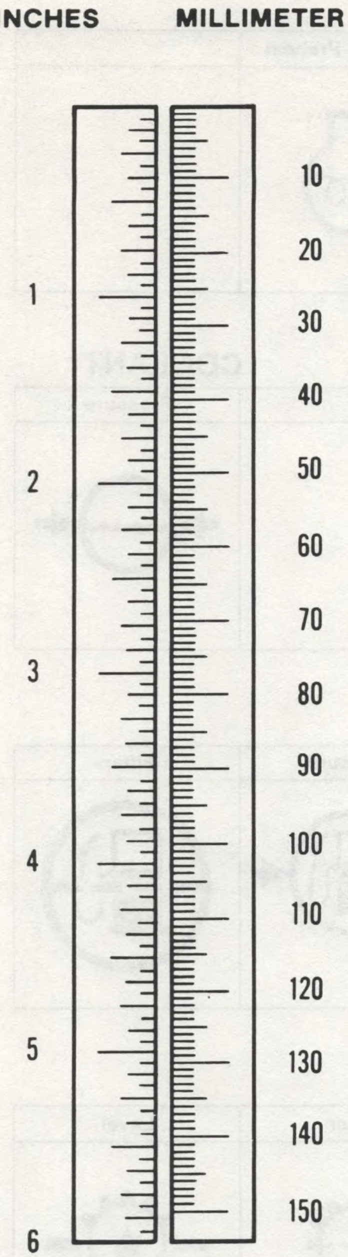
TRANSMISSION OIL

Level		Pressure	Temperature	Filter	Level
					

HYDRAULIC OIL

Pressure	Temperature	Filter	Level		
					

METRIC (SI) MEASUREMENTS



ENGLISH UNIT	METRIC EQUIVALENT (SI)
	Area
1 square inch	6.45 cm2 - square centimeter
1 acre	0.405 ha - hectare
	Force
1 pound (force)	4.45 N - newton
	Length
1 foot	304.8 mm - millimeter, 30.5 cm - centimeter, 0.305 m meter
1 inch	25.4 mm - millimeter, 2.54 cm - centimeter
1 mile	1609 m - meter, 1.61 km - kilometer
1 pound	0.454 kg - kilogram
	Power
1 horsepower	0.746 kW - Kilowatt
	Pressure
1 psi	6.89 kPa - kilopascal, 0.00689 MPa - megapascal, 14.696 - bar
	Temperature
1 degree Fahrenheit	$\frac{(F^\circ - 32)}{1.8}$ = C degree Celsius
	Torque
1 lb (force) - ft	1,356 Nm
	Velocity
1 mile per hour	1.61 km/h - kilometer per hour
	Volume
1 bushel	0.035 m3 - cubic meter
1 gallon (US)	3.79 L - liter
1 quart (US)	0.946 L - liter

CONTENTS

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Specifications 9-14
Operating Controls and Instruments 15-26
Operating Instructions 27-66
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NOTES:

To The Owner/Operator

DO NOT use or operate this tractor until this manual has been read and understood.

Foreword

This manual has been compiled to assist the owner and/or operator with the correct operation, service and routine preventative maintenance procedures of the Belarus tractor.

This manual has been designed into eight major sections: Foreword, Safety, Specifications, Operating Controls and Instruments, Operating Instructions, Lubrication and Routine Maintenance, Troubleshooting and Index. A general contents page is located at the beginning of the manual for a quick reference to the major sections. For a specific item, there is an alphabetical index placed in the rear of the manual.

Throughout the manual references are made to left side and right side. These terms are used as viewed from the tractor seat looking forward. The right hand and left hand side of the tractor are the same as your right hand and left hand.

In order to get the optimum performance and efficiency that has been designed into the tractor, read this manual thoroughly before operating or servicing the tractor. Become familiar with all decals and safety messages within the manual and on the tractor. Keep this manual in a convenient place for easy reference when problems arise. **Do not** attempt to make repairs or adjustments you do not understand. If you require additional information or service, contact your dealer.

The signal words **CAUTION, WARNING** or **DANGER** are used to indicate degree of hazards and to warn against unsafe practices that may cause personal injury and are used with appropriate safety instructions. These signal words are not to be ignored, your safety is involved.

CAUTION: denotes a general reminder of good safety practices or directs attention to unsafe practices.

WARNING: denotes a hazard intermediate between DANGER and CAUTION.

DANGER: denotes the most serious hazard.

The word **NOTE,** is used to convey information that is out of context with the manual text; special information such as specifications, techniques, reference information and other information of a supplementary nature.

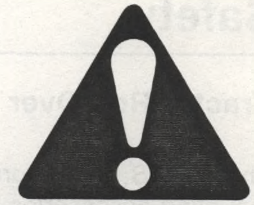
The word **IMPORTANT**, is used in the text when immediate damage will occur to the machine due to improper technique or operation. **IMPORTANT** will apply to the same information as specified by **NOTE,** only of an immediate and urgent nature.

It is the responsibility of the user to read the Operator's Manual and comply with the operating instructions, service and maintenance guidelines set forth in the manual.

The user is responsible for inspecting the machine daily, and for having parts replaced or repaired when continued use of the product would cause damage or excessive wear to other parts or make the machine unsafe.

NOTES:

Whenever you see this symbol, it means Attention! Become Alert! Your Safety is involved.



Operating instructions must be given to everyone before operating this tractor and at least once a year thereafter in accordance with OSHA regulations.

Safety

Operating Safety Practices

READ THIS MANUAL COMPLETELY and make sure you understand the controls. All equipment has limitations. Be sure you understand the speed, brakes, steering, stability, and load characteristics of the tractor before you start to operate.

The safety information given in this manual does not replace safety codes, insurance needs, federal, state, and local laws. Be sure your tractor has the correct equipment required by local laws and regulations.

Every possible circumstance that might involve potential hazard can not be anticipated. The warnings, cautions and safety suggestions in this manual are therefore not all inclusive. If an operating procedure, tool device, maintenance or work method not specifically recommended is used, you must satisfy yourself that it is safe for you and other persons. You must also ensure that the tractor will not be damaged or made unsafe by the procedures you choose.

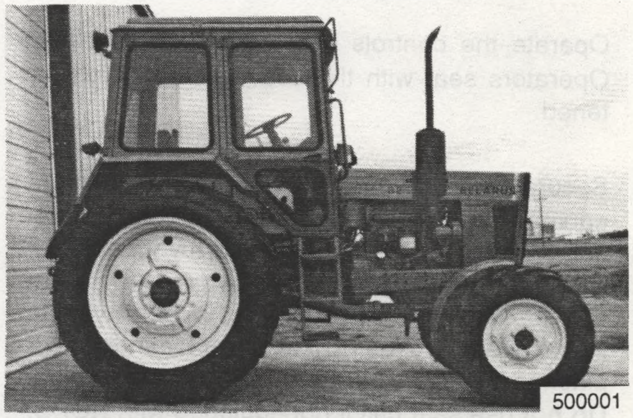
Before operation of this tractor, be sure **all** operators are familiar with the controls, maintenance information and safety rules throughout this manual. Be sure that all operators read and understand them. Failure to follow these suggestions may result in bodily injury or death. **DO NOT** allow any untrained or unauthorized persons at the controls.

Roll Over Protective Structure (ROPS)

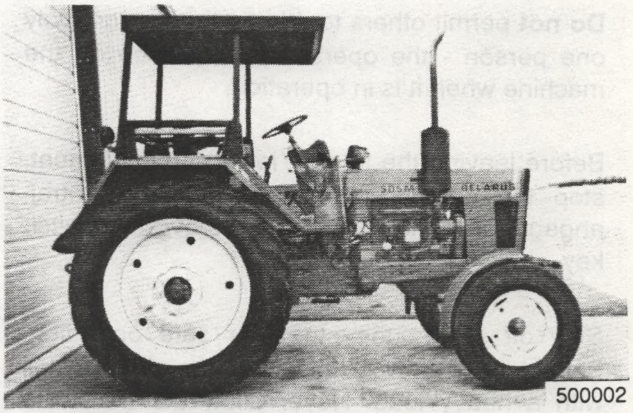
If your tractor is equipped with ROPS, all ROPS structures are equipped with seat belts. Seat belts are a part of your protective system and must be worn at all times. If the protective frame is to work, the operator must be held to the seat inside the frame.

The National Institute for Farm Safety advises that "Statistics show that the severity of injuries has been greatly reduced and fatalities practically eliminated through the use of both ROPS and seat belts when misuse or operator error causes a tractor to overturn."

WARNING: The protection offered by ROPS will be impaired if it is subjected to any modification, structural damage, or has been involved in an overturn. The ROPS must be replaced after a rollover.



ROPS CAB



4 POST ROPS FRAME

Safety

Tractor Roll Over

The ROPS, operators seat, seat belts, and all mounting accessories inside the operator protective system must be carefully checked after a tractor accident and all parts with damage, replaced immediately. **Do not** try to make repairs or weld the ROPS.

Do not make modifications to the ROPS. For example; welding an accessory to the ROPS or drilling a hole in the ROPS.

Special fasteners are used to install the ROPS structure and operator protective parts. Replacement parts must be the same as given in the Parts Catalog for your tractor.

Safety Rules

- Before starting the engine, make sure all operating controls are in the neutral position. This will prevent accidental movement of the tractor or start up of power driven equipment.

- Operate the controls only when seated in the Operators seat with the seat belt securely fastened.

- Securely fasten your seat belt if your tractor is equipped with a ROPS frame for your protection. The seat belt can help ensure your safety if it is used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members. **Do not** use seat belt if not equipped with ROPS.

- **Do not** permit others to ride on the tractor. Only one person - the operator - should be on the machine when it is in operation.

- Before leaving the tractor, lower the implement, stop the engine, put all controls in neutral, engage the hand brake, and remove the switch key.

- Stay off slopes too steep for safe operation. Shift down before you start up or down a hill with a heavy load. Never allow the tractor to "free wheel" with clutch disengaged or the transmission in neutral.

- Travel speed should be such that complete tractor control and stability is maintained at all times. Where possible, avoid operating near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.

- **Do not** drive on roads, or at high speed anywhere with the differential lock engaged. Difficult steering will occur and can result in an accident. Use the differential lock in field operations only when traction improvement is required, but release for turning.

- Rear upset can result if pulling from the wrong location on the tractor. Hitch only to the drawbar. Use 3-point hitch only with implements designed for its use - not as a drawbar.

- **Always** check the area around you to be sure it is clear of other persons before starting the tractor engine or PTO driven implements in motion.

- **Always** make sure that the weight of a trailed vehicle that is not equipped with independant brakes, never exceeds the weight of the tractor towing the vehicle. Stopping distance increases with increasing speed as the weight of the towed load increases, especially on hills and slopes.

- Pin the drawbar in a stationary position, lock the drawpin in place and use a safety chain when towing equipment on public roadways. Add SMV emblem, reflectors, and/or auxillary lighting on equipment as required.

- Use the hazard flasher lights when traveling on public roads day or night, unless prohibited by law. Use and keep the SMV emblem visible from the rear. Pull over to let faster traffic pass. Slow down and signal before turning off. Keep all lights and reflectors clean.

- Lock the brake pedals together for road travel. This will ensure uniform brake application and maximum stopping ability.

- PTO driven machinery can cause serious injury or death. Before working on or near the PTO shaft, or servicing or clearing the driven machine, put the PTO lever in the disengaged position, stop the tractor engine and wait for all motion to come to a complete stop before servicing.

- When doing stationary PTO work, always apply the hand brake. When dismounting from the tractor keep clear of all moving parts. Keep all guards and shields in place. The PTO guard must be in place to prevent injury to the operator or other persons.

- **Always** keep the machine safety decals clean. Replace any decals that are damaged, painted over, or missing.

- **Never** refuel the tractor when the engine is hot or running. **Never** smoke while refueling. **Do not** overfill the fuel tank - leave room for fuel expansion. Refuel in a safe place away from open fire or sparks.

- **Never** allow anyone to stand between the tractor and drawn implement while the tractor is backing to hitch.

- **Never** operate the engine in a closed building. Proper ventilation is required under all circumstances.

- Fluids under pressure can cause serious injury. **Never** use your hands to locate hydraulic oil or diesel fuel leaks. Use a piece of cardboard or wood for this purpose. Relieve all pressure before disconnecting any lines. If pressure fluid has penetrated the skin, get immediate medical attention.

- Battery explosion and/or damage to electrical components can result from improper connection of booster batteries or charger. Connect positive to positive and negative to negative. Externally, battery acid can cause burns and/or blindness, and taken internally is poison. **Never** smoke or allow flames near batteries when filling or servicing. Wear eye protection when charging or servicing batteries.

- **Never** use ether starting fluid as a starting aid. The engine is equipped with a glow plug, use of ether to assist starting may result in an explosion and/or serious injury.

- **Do not** pull with elastic tow ropes. Elastic stores energy. Sudden release may cause injury or death.

- Avoid possible injury or death from a runaway machine.

    1. **Do not** start engine by shorting across starter terminals. This bypasses normal circuit and tractor may start in gear.
    2. Start engine only from the operators seat with transmission in neutral. **Never** start engine while standing on the ground.

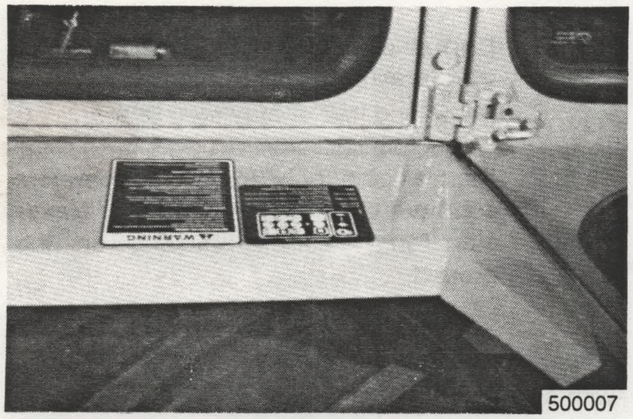
- **Never** weld or attempt repairs on a wheel or rim with an inflated tire.

- **Never** bypass or wire around any neutral safety switch device. If the starting motor will not operate in the transmission neutral position, or will operate in any transmission range other than neutral, service is required. Starter engagement in any position out of neutral is potentially hazardous to the operator and others.

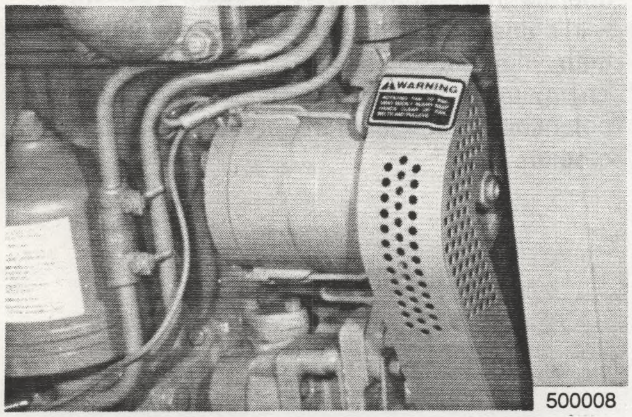
Decals

Be certain that all decals are kept clean and legible.

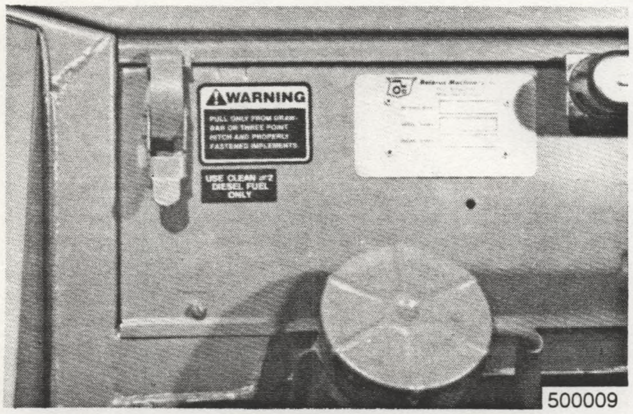
Replace any decals that are lost, damaged, or painted over.


500007

Location: Center of Right Fender


500008

Location: Engine Right Side on Alternator Shield


WARNING
PULL ONLY FROM DRAW-BAR OR THREE POINT HITCH AND PROPERLY FASTENED IMPLEMENTS.
USE CLEAN #2 DIESEL FUEL ONLY
500009

Location: Rear of Tractor Adjacent to Fuel Fill Port

⚠WARNING

BEFORE STARTING ENGINE

- Do not use or operate this tractor before reading the Operators Manual for Safety Information and Operating Information.
- Read all tractor safety signs.
- Be sure other persons are clear of tractor and implement.
- Start engine and operate controls only when seated in operators seat.
- With ROPS, always buckle and properly adjust seat belt.

OPERATION

- Do not permit riders on tractor or implement.
- Keep hands, feet and clothing away from power driven parts.
- Where possible, avoid operating near ditches, embankments and holes.
- Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
- Stay off slopes too steep for safe operation.
- Operate tractor smoothly, no jerky turns, starts or stops.
- For road travel, couple brake pedals, use flashing warning lamps unless prohibited by law, and keep SMV emblem visible to the rear.
- Do not disengage clutch or allow tractor to coast with transmission in neutral when going down hill.
- Avoid rear upset, pull only from drawbar or three point hitch and properly fastened implements.
- Shields are for your protection. Keep them in place.

WHEN TRACTOR IS STOPPED

- Engage park brake.
- Lower implement to ground.
- Disengage PTO, stop engine, and wait for all motion to stop before servicing or cleaning equipment.

⚠WARNING

ROTATING FAN. TO PREVENT BODILY INJURY KEEP HANDS CLEAR OF FAN, BELTS AND PULLEYS.

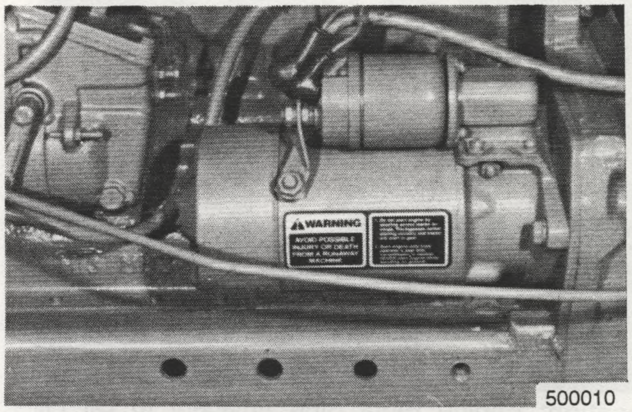
⚠WARNING

PULL ONLY FROM DRAWBAR OR THREE POINT HITCH AND PROPERLY FASTENED IMPLEMENTS.

⚠ WARNING

AVOID POSSIBLE INJURY OR DEATH FROM A RUNAWAY MACHINE

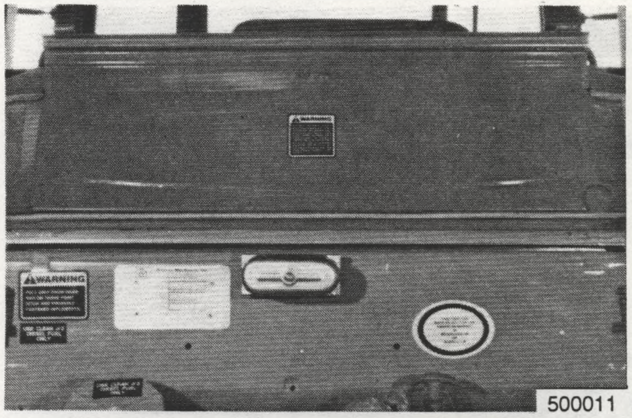
1. Do not start engine by shorting across starter terminals. This bypasses normal starting circuitry and tractor will start in gear.
2. Start engine only from operator's seat with transmission in neutral. NEVER start engine while standing on ground.


500010

Location: Engine Left Side on Starter

⚠ WARNING

ELECTRICAL SYSTEM IS 12 VOLT NEGATIVE GROUND. BATTERIES CONTAIN ACID AND EXPLOSIVE GAS. EXPLOSION CAN RESULT FROM SPARKS, FLAMES, OR WRONG CABLE CONNECTIONS. TO CONNECT JUMPER CABLES OR CHARGER, SEE MANUAL(S) FOR THE CORRECT PROCEDURE. FAILURE TO FOLLOW THE ABOVE INSTRUCTIONS CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.


500011

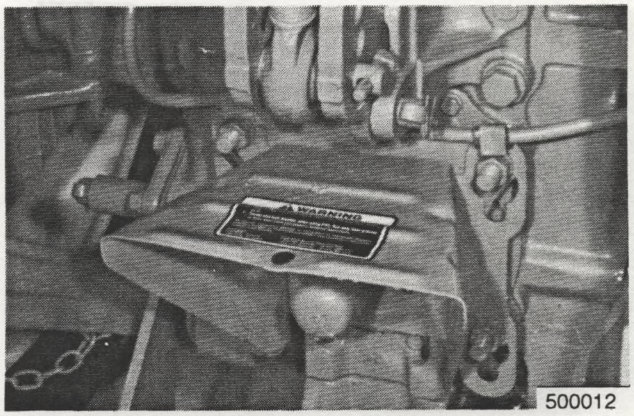
Location: Center of Battery Access Cover

⚠ WARNING

- Keep PTO safety shield in place for your protection.
- Always keep PTO Driveline shields in place to avoid entanglement.
- Keep hands, feet and clothing away from PTO and other moving parts.
- Center and lock drawbar when using PTO. Pull only from drawbar or three point hitch and properly fastened implements.

To prevent equipment damage or separation of implement driveline, position drawbar to implement equipment manufacturer's recommendations or as follows:

PTO Shaft	PTO Shaft End to Hitch Pin Hole
540 RPM - 6 spline	1-3/8 inch diameter - 14 inch (356 mm)
1000 RPM - 21 spline	1-3/8 inch diameter - 16 inch (407 mm)


500012

Location: Rear of Tractor on PTO Shaft Shield

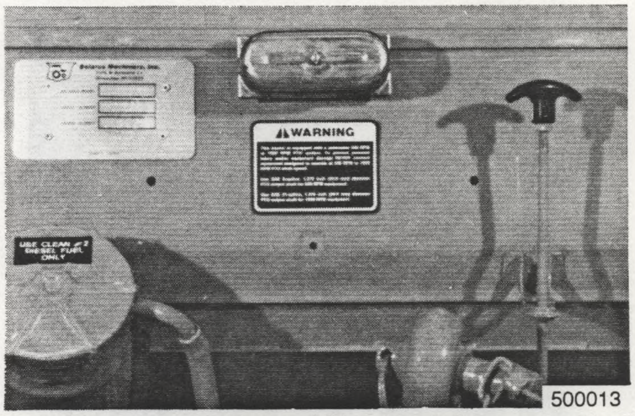
⚠ WARNING

This tractor is equipped with a selectable 540 RPM or 1000 RPM PTO system. To prevent personal injury and/or equipment damage NEVER connect equipment designed to operate at 540 RPM to 1000 RPM PTO shaft speed.

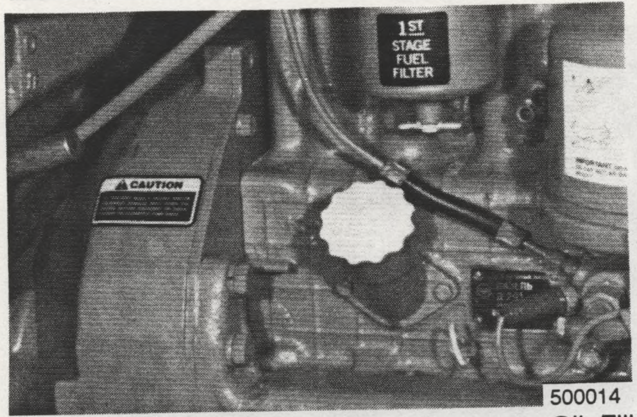
Use SAE 6-spline, 1.375 inch (34.9 mm) diameter PTO output shaft for 540 RPM equipment.

Use SAE 21-spline, 1.375 inch (34.9 mm) diameter PTO output shaft for 1000 RPM equipment.

903824


500013

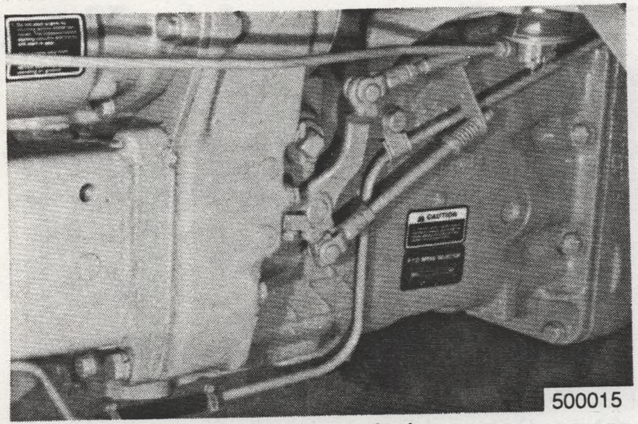
Location: Center Rear of Tractor Adjacent to Fuel Fill Port



Location: Engine Right Side Adjacent to Oil Fill Port

⚠ CAUTION

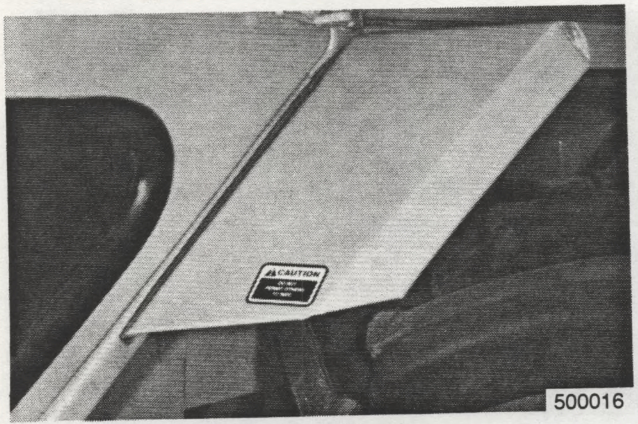
TO PREVENT BODILY INJURY AND/OR EQUIPMENT DAMAGE, SHUT DOWN THE ENGINE BEFORE ENGAGING OR DISENGAGING THE HYDRAULIC PUMP DRIVE.



Location: Left Side of Transmission

⚠ CAUTION

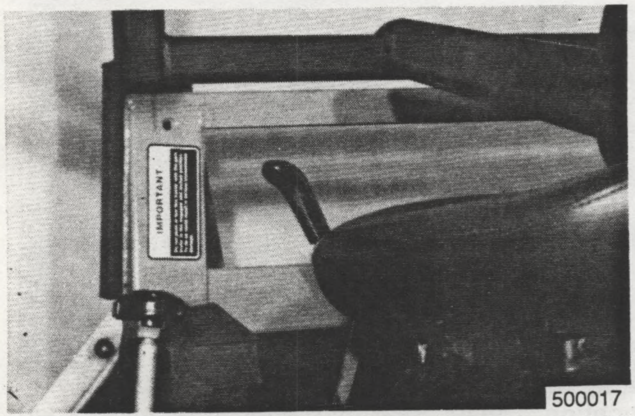
TO PREVENT BODILY INJURY AND/OR EQUIPMENT DAMAGE, SHUT DOWN THE ENGINE BEFORE ENGAGING OR DISENGAGING THE PTO SHAFT DRIVE.



Location: Lower Front Left Fender

⚠ CAUTION

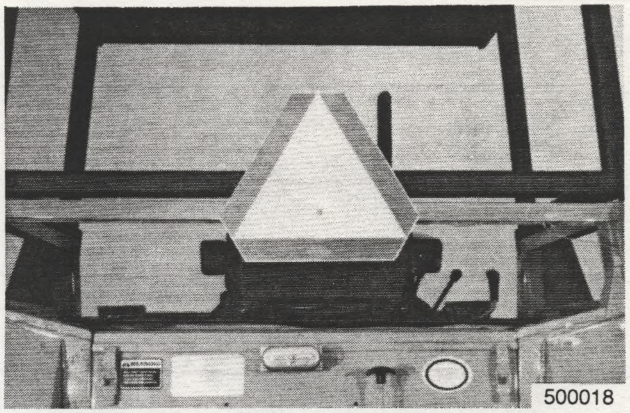
DO NOT
PERMIT OTHERS
TO RIDE



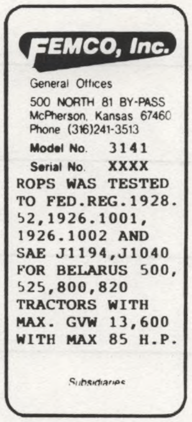
Location: Right Inside of Cab Adjacent to PTO Lever

IMPORTANT

Do not push or tow this tractor with the park brake in the engaged and locked position. To do so could result in serious transmission damage.



SMV Symbol - Rear of Tractor



FEMCO, Inc.

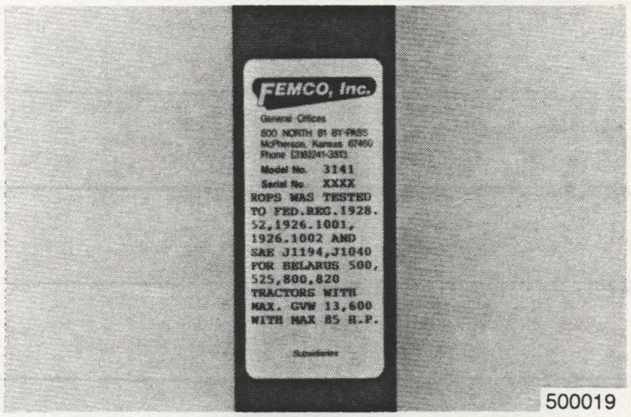
General Offices
500 NORTH 81 BY-PASS
McPherson, Kansas 67460
Phone (316)241-3513

Model No. 3141

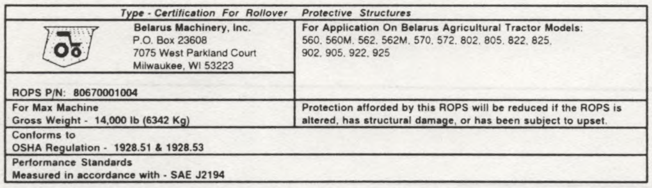
Serial No. XXXX

ROPS WAS TESTED
TO FED.REG.1928.
52,1926.1001,
1926.1002 AND
SAE J1194,J1040
FOR BELARUS 500,
525,800,820
TRACTORS WITH
MAX. GVW 13,600
WITH MAX 85 H.P.

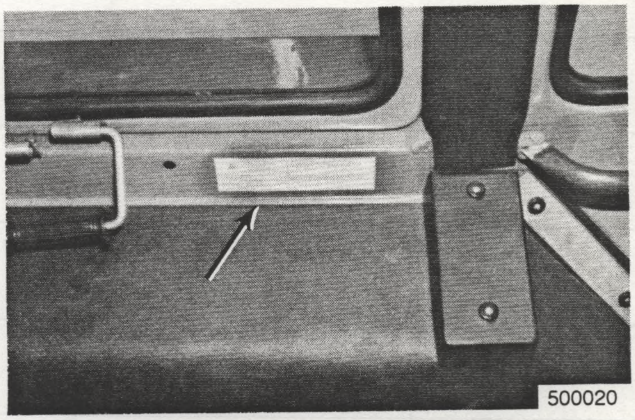
Subsidiaries



Location: 4-Post ROPS Frame Label - Inside Vertical ROPS Post



Type - Certification For Rollover Protective Structures	
Belarus Machinery, Inc. P.O. Box 23608 7075 West Parkland Court Milwaukee, WI 53223	**For Application On Belarus Agricultural Tractor Models:** 560, 560M, 562, 562M, 570, 572, 802, 805, 822, 825, 902, 905, 922, 925
ROPS P/N: 80670001004	
For Max Machine Gross Weight - 14,000 lb (6342 Kg)	**Protection afforded by this ROPS will be reduced if the ROPS is altered, has structural damage, or has been subject to upset.**
Conforms to OSHA Regulation - 1928.51 & 1928.53	
Performance Standards Measured in accordance with - SAE J2194	



Location: Cab ROPS Label - Lower Left Side Cab Rail

NOTES:

IMPORTANT: All fluid capacities listed throughout this section are a guide to the quantities required. Always use dipsticks or level plugs to ensure that the units are filled to the correct level. DO NOT over fill!

General Specifications

Clutch

Type: Dry, spring loaded, single plate. Mechanically activated.
Diameter: 13 inch (340 mm)

Brakes

Type: Individual rear wheel dry disc type located in rear axle final drives. Mechanically actuated, and individual brake pedals with interlock.
Brake Diameter: 7 inch (180 mm)

Electrical System

Type: 12 volt, negative ground
* **Batteries:** Two 6-volt, 900 CAA batteries connected in series. Battery Group size 4 or; two 12-volt, 740 CAA batteries connected in parallel. Group Size 49.
Alternator: 12 volt, 50 ampere output with integral built in regulator
* **Cranking Motor:** 12 or 24 volt, with solenoid switch
Head Lamps: (2) 55 watt, replaceable bulb type (Belarus P/N A12-45X40).
Rear Work Lamps: (2) 55 watt, replaceable bulb type (Belarus P/N A12-32)
Turn Signal Lamps: (4) 12 volt, amber lens (GE-57 bulbs)
Tail Lamps: (2) 12 volt, red lens (GE-57 bulbs)
Rear Outlet: 7 terminal outlet for direction lamps, tail lamps, and 12 volt power for implements
Electrical Circuit Fuses: Replaceable type

* Models 570, 572 and all 800 Series tractors are equipped with two 12 volt batteries and 24 volt cranking motors. Models 560M and 562M can be equipped as 12 or 24 volt cranking motors.

Electrical Circuit Fuse Service Rating

Head Lamps: 15 amp
Horn: 15 amp
Stop Light: 15 amp
Indicators: 5 amp
Wipers: 15 amp
Park Lights: 15 amp
Turn Signal Lamps: 10 amp
Cab Blowers: 15 amp
Air Conditioner Blower: 30 amp

Front Drive Axle (If equipped)

Type: Adjustable tubular beam with spring mounted front wheels
Front Differential: Ring and bevel gear type, self locking with floating spiders and friction clutches
Front Axle Planetary: Spur gear type reduction gears and free-wheeling clutch
Control: Three-position lever control; "Off", "Automatic", and "Forced"
Front Differential Oil Capacity: 1.8 U.S. qts (1.7 L)
Front Final Drive Oil Capacity: 2.4 U.S. qts (2.3 L) each
Front Axle Shaft Upper Bevel Gear Housing Oil Capacity: 0.3 L each
Lubrication Oil Type: SAE 80-90 or 90 gear oil meeting API Classification GL-5 and/or MIL-L-2105B specifications.

General Specifications

Engines

Engine Model	D-60	D-242	D-244	D-240	D-243
Tractor Series	500	500	500	800 - 900	800 - 900
Make	MTZ	MTZ	MTZ	MTZ	MTZ
Type	4 cyl in-line	4 cyl in-line	4 cyl in-line	4 cyl in-line	4 cyl in-line
Cycle	4 Stroke	4 Stroke	4 Stroke	4 Stroke	4 Stroke
Fuel Injection System	Pre-Combustion	Direct	Direct	Direct	Direct
Compression Ratio	16:1	16:1	16:1	16:1	16:1
Bore	4.33 in (110 mm)	4.33 in (110 mm)	4.33 in (110 mm)	4.33 in (110 mm)	4.33 in (110 mm)
Stroke	4.92 in (125 mm)	4.92 in (125 mm)	4.92 in (125 mm)	4.92 in (125 mm)	4.92 in (125 mm)
Displacement	290 cu in (475 L)	290 cu in (475 L)	290 cu in (4.75L)	290 cu in (4.75 L)	290 cu in (4.75 L)
Engine Aspiration	Natural	Natural	Natural	Natural (See Note 1)	Natural See Note 1)
Cooling System	Liquid	Liquid	Liquid	Liquid	Liquid
Minimum Idle Speed	600 rpm	600 rpm	600 rpm	600 rpm	600 rpm
Governor Speed (Approx) (Maximum - No Load)	1950 rpm	1950 rpm	1950 rpm	2385 rpm	2385 rpm
Rated Speed	1800 rpm	1800 rpm	1800 rpm	2200 rpm	2200 rpm
Peak Torque (lb ft)	197 at 1300 rpm	198 at 1300 rpm	193 at 1300 rpm	212 at 1400 rpm (See Note 2)	215 at 1400 rpm (See Note 2)
Firing Order	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Intake Valve Setting	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)
Exhaust Valve Setting	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)	0.012 in (0.3 mm)
Crankcase Oil Capacity	16 qts (15 L)	16 qts (15 L)	16 qts (15 L)	16 qts (15 L)	16 qts (15 L) (See Note 3)
Cooling Capacity	21 qts (20 L)	21 qts (20 L)	21 qts (20 L)	21 qts (20 L)	21 qts (20 L)

NOTE 1: 900 Series Tractor engines are Turbocharged.

NOTE 2: Peak Torque not available for 900 Series Tractors.

NOTE 3: Crankcase oil capacity for 900 Series Tractor is 16.5 qts (15.6 L).

Engine Lubrication System

Type System: Constant pressure and splash with external crankcase oil cooler radiator

Oil Filter (1): Centrifugal type

Minimum Oil Pressure (warm, 600 rpm): 7 to 11 psi (0.5 to 0.78 Bar)

Normal Oil Pressure (warm, 1800 rpm): 28 to 49 psi (1.9 to 3.3 Bar)

* **Crankcase Oil Capacity:** 16 U.S. qts (15 L)

Lubricating Oil type: Use engine oil meeting API Service Classification CD/SD or MIl-L-2104C or Series 3 type for single grade oils. Use API Service Classification CE, CD, CC/SG or MIL-L-46152 for Multi-Viscosity engine oils

* Add .5 qt (.4 L) additional oil for 900 Series Tractors

Engine Fuel System

Injection Pump: Four plunger type with booster pump

Governor: Mechanical, variable speed

Fuel Filters: (2) 1-primary, 1-secondary

Fuel Type: No. 2D

Fuel Tank Capacity: Two tanks, 17 U.S. gal. (65 L) each

Fuel Pump Lubricating Oil Capacity: 0.25 qt (0.24 L)

Cold Start Aid: Electric plug heater in manifold

* **Air Intake System:** Oil Bath

Oil Bath Capacity: 1.6 qt (1.5 L)

* Dry type on 900 Series

Engine Cooling System

Type: Pressurized liquid cooling system with thermostat temperature control
Normal Operating Temperature: 167°F to 212°F (75°C to 100°C)
Cooling System Capacity: 21 U.S. qts (20 L)
Radiator Cap: 7 psi (0.5 Bar) (62 KPa)

Hydraulic System

Type: Open Center
Pump: Single stage gear pump
Pump Capacity at 1800 rpm: 9 gpm (45 Lpm)
Maximum System Pressure: 2600 to 2850 psi (182 to 199.5 Kg/cm^2)
Remote Control Valve (3): Open Center, 4-position with hydraulic kick-out in raise and lower positions.
Reservoir Capacity: 22 U.S. qts (20.6L)
Hydraulic Filter: Paper Element
Oil type: All purpose hydraulic oil or SAE20, 30 or Multigrade engine oil with antiwear additives

Rear Power Take Off (PTO)

Type: Selectable, live independent of transmission or synchronized ground speed drive
PTO Clutch: Band operated over planetary gears
Control: Mechanical, lever activated
** **PTO Shaft Speed:** 540 rpm and/or 1000 rpm, or 3.5 rpm (rev/per meter) synchronized ground speed
PTO Shaft Size: SAE standard 6-spline, 1.375 inch diameter for 540 rpm shaft speed. SAE standard 21-spline, 1.375 inch diameter for 1000 rpm shaft speed
Rotation (viewed from rear): clockwise

** Synchronized PTO shaft speed available on all 500, 800 and 900 Series Tractors
540 rpm independent shaft speed only on 500 Series Tractors (540 rpm at 1632 engine rpm)
540 or 1000 rpm independent shaft speed available on 800 and 900 Series Tractors. (540 rpm at 2075 engine rpm and 1000 rpm at 2182 engine rpm)

Hitch System

Type: Category II three point with draft and/or position control
Type Control: Hand lever controlled
Type Valve: 4-position; Lift, Neutral, Lower and Float
Lift Capacity (at end of lower links): 3325 lb (1506 Kg)
Drawbar: Standard adjustable swing type

Steering System

Type: Piston and rack, hydraulic power assist
Pump type: Positive Displacement, gear
Pump Capacity: 5.5 gpm (21 L) at 1800 rpm
Operating Pressure: 1500 psi (105 Kg/cm^2)

Transmission/Differential

Type: Mechanical, constant mesh with Hi-Lo range
Speed Selection: 9 forward, 2 reverse gears, or 18 forward, 4 reverse if equipped with speed reducer.
Differential: Spiral bevel ring gear and pinion.
Differential Lock: Friction clutch with sensor control to disengage when turning angle exceeds 10° left or right
Oil Capacity: 10.5 U.S. gal (40 L)
Lubricating Oil Type: HD SAE 80-90 or 90 gear lube oil meeting API Classification GL-5 and/or MIL-L-2105B Specifications

Wheel Lug Bolt Torques

Front (2WD)	88 - 103 lb ft (120 - 140 Nm)
Front (MFD)	148 - 184 lb ft (200 - 250 Nm)
Rear (All)	190 - 210 lb ft (258 - 285 Nm)

General Specifications

Tire Inflation Pressures and Maximum Recommended Loads Chart

Tire Size	Wheel Position	Tire Rating	Tread Type	*Inflation Pressure and Maximum Load Capacity					
				14 PSI (97 Kpa)	16 PSI (108 Kpa)	20 PSI (137 Kpa)	24 PSI (166 Kpa)	28 PSI (193 Kpa)	35 PSI (244 Kpa)
7.50 x 20	Front	6 ply	F2			1298 lb (590 Kg)	1452 lb (660 Kg)	1644 lb (745 Kg)	1837 lb (835 Kg)
11.2 x 20	Front	6 ply	R1	1683 lb (765 Kg)	1782 lb (810 Kg)	2046 lb (930 Kg)	2046 lb (1040 Kg)	2436 lb (1104 Kg)	2585 lb (1175 Kg)
15.5R x 38	Rear	8 ply	R1	3168 lb (1440 Kg)	3365 lb (1530 Kg)	3872 lb (1760 Kg)	4312 lb (1960 Kg)		
18.4L x 30	Rear	8 ply	R1		4620 lb (2100 Kg)				

*The maximum load capacity shown is per single wheel with the tire inflated to the pressure indicated. Do not exceed the maximum load capacity of the tire.

Tire Inflation Specifications

For normal tractor operation, use the inflation pressure shown in the chart. For front loader operation, use the maximum inflation pressure indicated in the chart for front tires.

For maximum tractor performance, adjust rear tire pressures within the minimum and maximum range to conform with the actual load on the tires. Under normal conditions, use the minimum pressure rating for drawbar work. Use the higher pressure rating for heavy three point hitch mounted equipment. If dual rear tires are used, inflate the outside dual tire 2 psi (14 Kpa) less than the inner tire.

IMPORTANT: *Tractors equipped with mechanical front drive must use front and rear tire combinations that are correctly matched. The use of correctly matched tire combinations will give maximum tractor performance, extended tire life and reduced wear on drive train components. Mixing worn and new tires or tires of different diameters or loaded radii can give incorrect ground speed match.*

WARNING: ***DO NOT remove, install or make repairs to a tire on a rim. DO NOT weld or otherwise try to repair a rim with an inflated tire. Take the tire and rim to a tire shop where persons with special training and special safety tools are available. NEVER exceed the tire manufacturers maximum recommended inflation pressure. Tires can explode with much force and thrust the tire in any direction and may cause bodily injury or death.***

APPROXIMATE TRAVEL SPEEDS

500 Series Tractor Models

Engine Speed: 1800 RPM
Rear Tire Size: 15.5 x 38

Gear	MPH	KPH	*Reduction Range (KPH)
1	1.3	2.1	1.0 (1.6)
2	2.2	3.6	1.7 (2.7)
3	3.5	5.6	2.9 (4.6)
4	4.2	6.7	3.8 (6.1)
5	4.9	7.9	4.7 (7.4)
6	6.0	9.7	5.5 (8.8)
7	7.1	11.4	6.5 (10.4)
8	9.4	15.1	7.9 (12.8)
9	17.4	28.1	13.2 (21.2)
R1	2.8	4.4	2.0 (3.4)
R2	4.7	7.5	3.5 (5.7)

*If equipped with speed reducer

800 and 900 Series Tractor Models

Engine Speed: 2200 RPM
Rear Tire Size: 15.5 x 38

Gear	MPH	KPH	Reduction Range (KPH)
1	1.6	2.6	1.2 (1.9)
2	2.7	4.4	2.1 (3.3)
3	4.3	6.9	3.5 (5.6)
4	5.1	8.2	4.6 (7.4)
5	6.0	9.6	5.7 (9.1)
6	7.3	11.8	6.7 (10.8)
7	8.7	13.9	7.9 (12.7)
8	11.5	18.4	9.7 (15.6)
9	21.3	34.3	16.1 (25.9)
R1	3.4	5.4	2.5 (4.1)
R2	5.7	9.2	4.3 (7.0)

NOTE: *Travel speeds listed are approximate at rated engine speed. No allowance is made for wheel slip.*

Engine Speeds

If MPH is desired for engine speeds other than rated RPM, use the following formula:

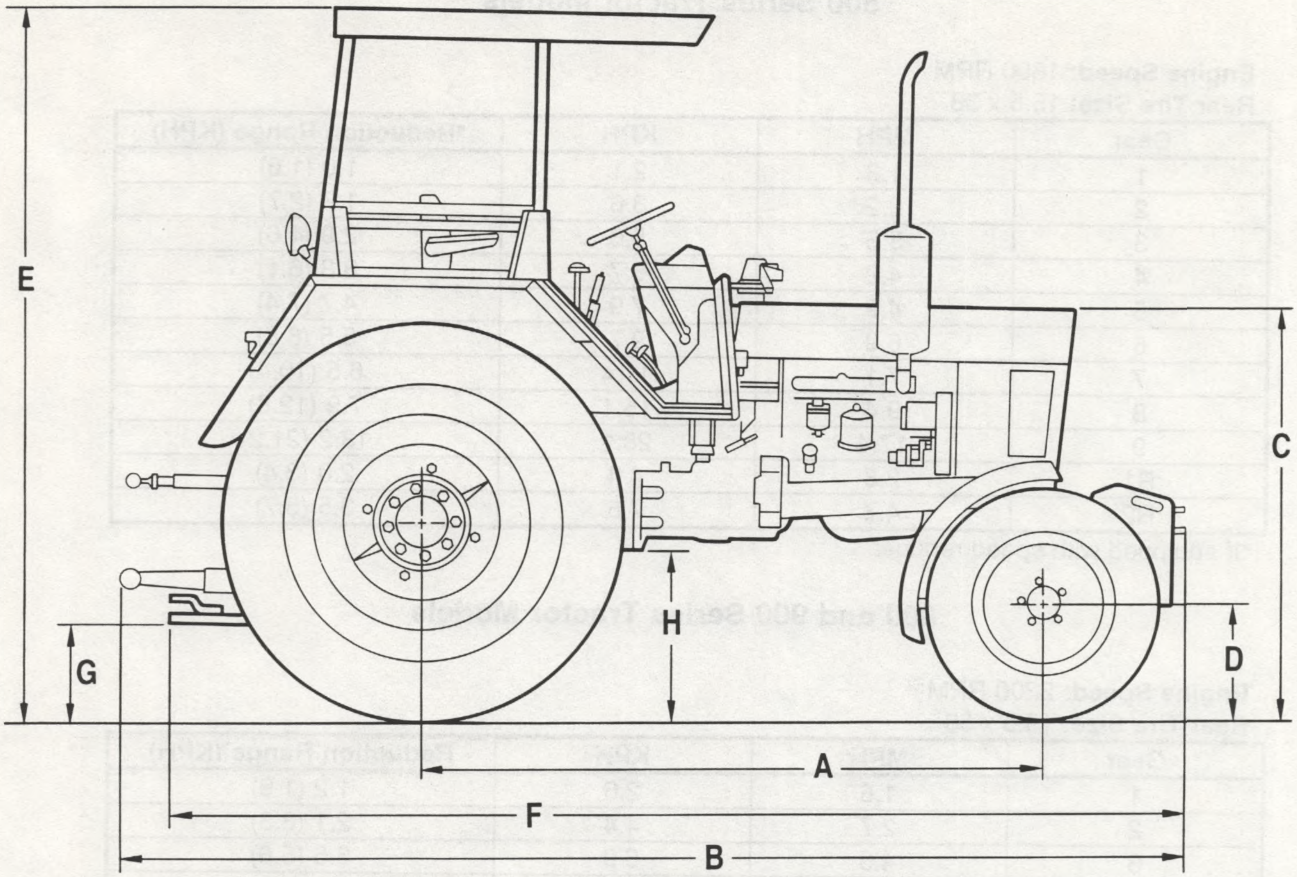
$$\text{MPH} = \frac{\text{MPH (chart)} \times \text{Engine RPM}}{\text{Rated RPM}}$$

Example:
If chart travel speed was 6.18 MPH and tractor has engine with rated speed of 1800 RPM and MPH wanted is at 1650 engine RPM:

$$\text{Then: MPH} = \frac{6.18 \times 1650}{1800} = 5.66 \text{ MPH } (9.11 \text{ KPH})$$

General Specifications

Two Wheel Drive Tractor Models

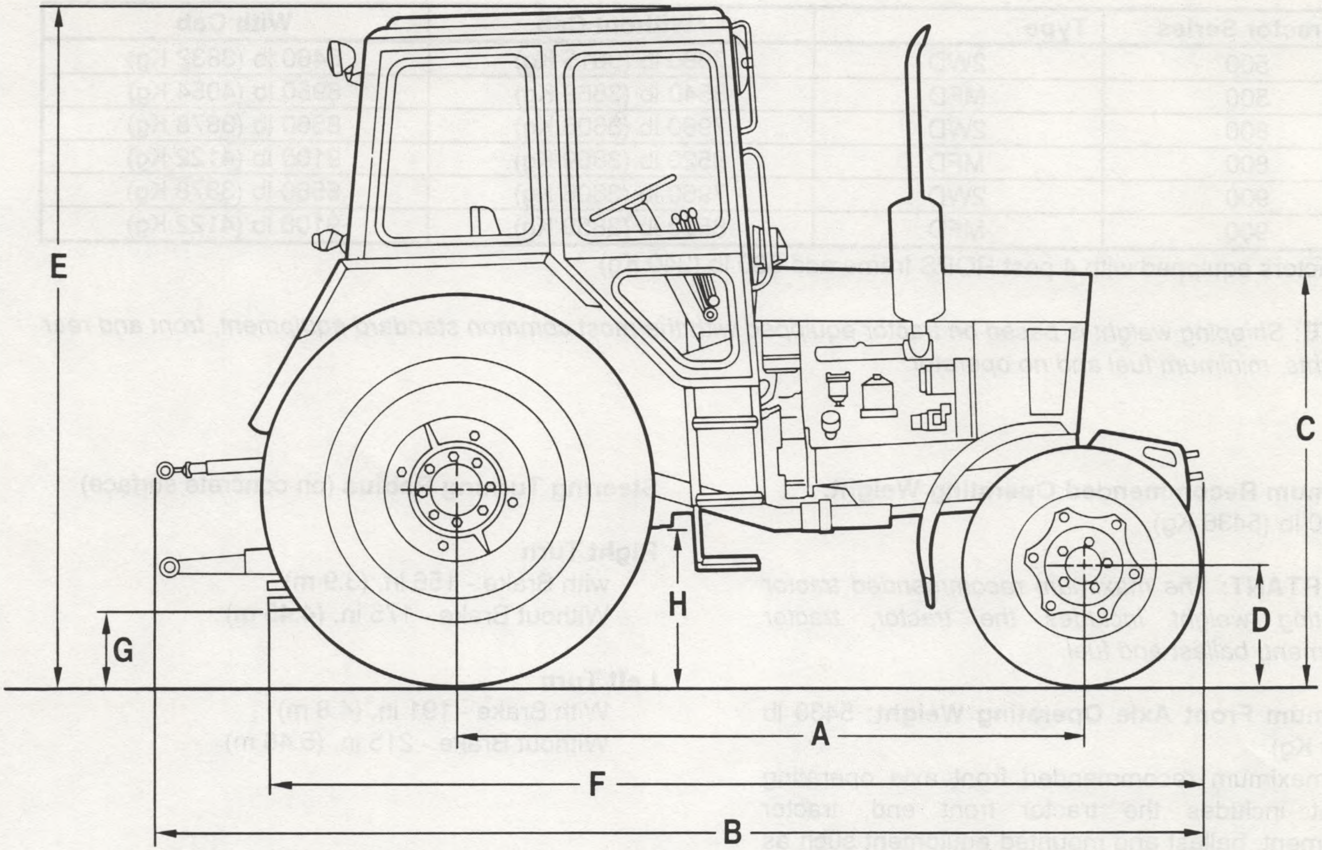


Tire and Wheel Equipment for Measurements Shown

Front - 9 x 20	**Rear - 15.5R x 38**
A. 93.5 in. (2375 mm) **B.** 161.0 in. (4090 mm) **C.** 64.75 in. (1645 mm) **D.** 17.5 in. (445 mm)	**E.** 106.75 in. (2711 mm) **F.** 152.0 in. (3861 mm) **G.** 12.0 in. (305 mm) **H.** 21.5 in. (546 mm)

Front Wheel Toe-In: 0.08 - 0.23 in. (2 - 6 mm)

Mechanical Front Drive (MFD) Tractor Models



Tire and Wheel Equipment for Measurements Shown

Front - 11.2 x 20	Rear - 15.5R x 38
A. 96.5 in. (2451 mm) **B.** 155.5 in. (3950 mm) **C.** 69.0 in. (1753 mm) **D.** 18.0 in. (457 mm)	**E.** 111.0 in. (2819 mm) **F.** 147.5 in. (3747 mm) **G.** 12.0 in. (305 mm) **H.** 24.0 in. (610 mm)

Front Wheel Toe-In: 0.12 - 0.31 in. (3 - 8 mm)

APPROXIMATE WEIGHTS AND MEASUREMENTS

Approximate Shipping Weights

Tractor Series	Type	*Without Cab	With Cab
500	2WD	7980 lb (3615 Kg)	8460 lb (3832 Kg)
500	MFD	8540 lb (3869 Kg)	8950 lb (4054 Kg)
800	2WD	7960 lb (3606 Kg)	8560 lb (3878 Kg)
800	MFD	8520 lb (3859 Kg)	9100 lb (4122 Kg)
900	2WD	7960 lb (3606 Kg)	8560 lb (3878 Kg)
900	MFD	8520 lb (3859 Kg)	9100 lb (4122 Kg)

* Tractors equipped with 4 post ROPS frame add 530 lb (240 Kg)

NOTE: *Shipping weight is based on tractor equipped with the most common standard equipment, front and rear weights, minimum fuel and no operator.*

Maximum Recommended Operating Weight:
12,000 lb (5436 Kg).

IMPORTANT: *The maximum recommended tractor operating weight includes the tractor, tractor equipment, ballast and fuel.*

Maximum Front Axle Operating Weight: 5430 lb (2460 Kg)
The maximum recommended front axle operating weight includes the tractor front end, tractor equipment, ballast and mounted equipment such as loaders and spray tanks.

IMPORTANT: *Do not exceed the maximum load capacity of the tires on the tractor. See Tire Inflation Pressure and Load Capacity Chart. Exceeding the maximum recommended tractor or front axle operating weight limits may void your tractor warranty.*

Steering Turning Radius (on concrete surface)

Right Turn
with Brake - 156 in. (3.9 m)
Without Brake - 175 in. (4.45 m)

Left Turn
With Brake - 191 in. (4.8 m)
Without Brake - 215 in. (5.46 m)

Know the Tractor Controls and Instruments to Assure Safe Operation

Operating Controls and Instruments

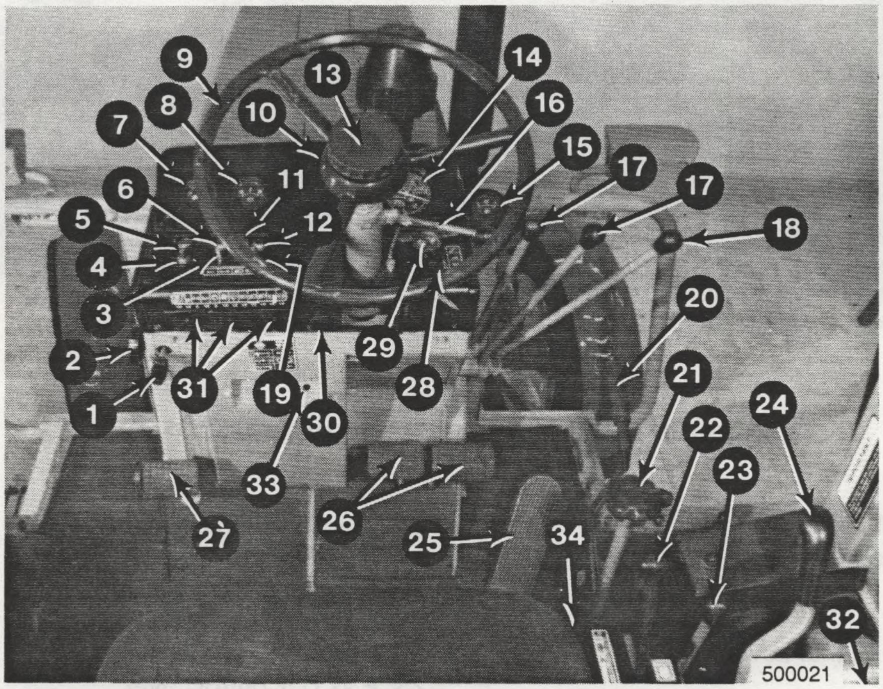


Figure 1: Operator Station

TRACTOR MODELS WITH STEEL STYLE INSTRUMENT PANEL

1. Differential Interlock Control
2. Radiator Shutter Control
3. Turn Signal Switch
4. Horn Button
5. Ground "On" Indicator Lamp
6. Turn Signal Indicator Lamp
7. Water Temperature Gauge
8. Ammeter Gauge
9. Steering Wheel
10. Oil Pressure Gauge
11. Park Brake Indicator Lamp
12. High Beam Indicator Lamp
13. Steering Wheel Height Lock Wheel
14. Tach-Speedometer and Hourmeter
15. Fuel Level Gauge
16. Steering wheel Tilt Lever
17. Remote Hydraulic Control Levers
18. Three Point Hitch Control Lever
19. Headlamp Hi-Lo Beam Switch
20. Park Brake Hand Lever
21. Transmission Gear Shift Lever
22. Depth Control Lever
23. Throttle Control Lever
24. PTO Control Lever
25. Throttle Control Pedal
26. Brake Pedals
27. Clutch Pedal
28. Key Start Switch
29. Flame Heater Indicator Lamp
30. Master Light Switch
31. Circuit Fuses
32. Ground Lock-out Switch (not shown)
33. Emergency Stop Cable Control
34. F.W.D. Control Lever (not shown)

Operating Controls and Instruments

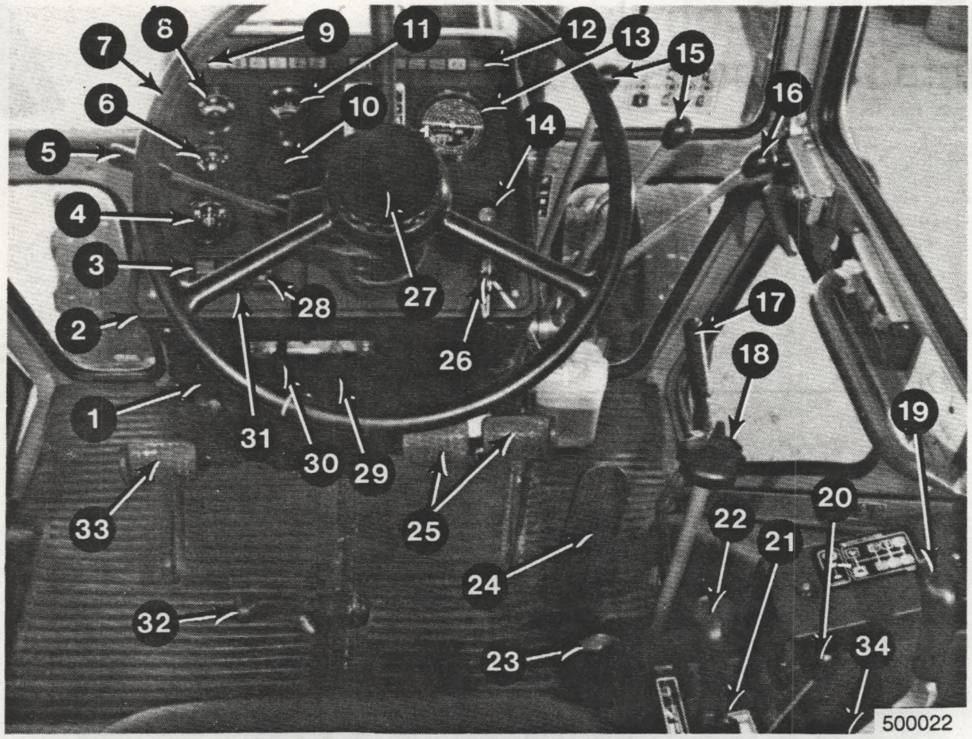


Figure 2: Operator Station

TRACTOR MODELS WITH MOULDED FIBERGLASS STYLE INSTRUMENT PANEL

1. Differential Interlock Control
2. Radiator Shutter Control
3. Light Switch
4. Ammeter Gauge
5. Hi-Low Beam/Turn Signal Lever
6. Fuel Level Gauge
7. Steering Wheel
8. Water Temperature Gauge
9. Indicator Light Test Switch
10. Pyrometer Gauge (if equipped)
11. Oil Pressure Gauge
12. Indicator Light Test Switch
13. Tach-Speedometer and Hourmeter
14. Flame Heater Indicator Lamp
15. Remote Levers
16. Hitch Lever
17. Park Brake Hand Lever
18. Transmission Gear Shift Lever
19. PTO Control Lever
20. Throttle Control Lever
21. Control Lever Stop
22. Depth Control Lever
23. F.W.D. Control Lever
24. Throttle Control Pedal
25. Brake Pedals
26. Key Start Switch
27. Steering Wheel Height Lock Wheel
28. Engine Flame Heater Switch
29. Steering Wheel Tilt Control
30. Engine Emergency Shutdown Lever
31. Window Washer Switch
32. Speed Reducer Shift Lever
33. Clutch Pedal
34. Ground Lock-Out Switch (not shown)

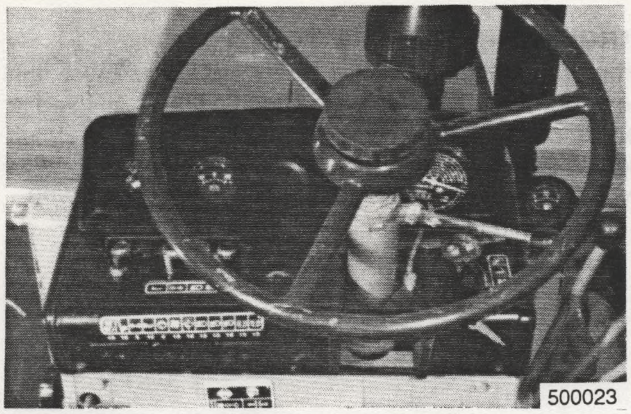


Figure 3: Steel Style Instrument Panel

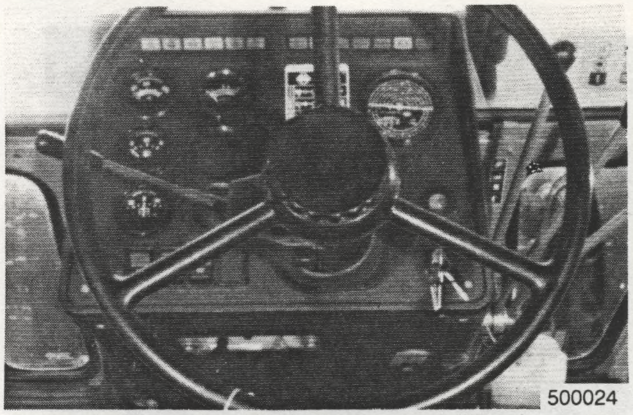


Figure 4: Fiberglass Style Instrument Panel

Operator Station

Before operating your tractor for the first time, become familiar with all of the controls and instrument locations and their function.

Your tractor may be equipped with either a steel style (Figure 3) or a moulded fiberglass style (Figure 4) instrument panel. Refer to the information that follows pertaining to the style of instrument panel supplied on your tractor.

The following information will help you become familiar with the controls and instruments in the operators station and understand their function so that the tractor may be operated safely.

IMPORTANT: *Refer to the Operating Information section of this manual for information on operating techniques and/or adjustments.*

KEY START SWITCH (1)

The key start switch used on tractors with this style dash is spring loaded to the off position of the switch. Turning and holding the switch to the "mid" (45°) position will energize the engine glow plugs or fuel flame heater to aid in cold ambient starting. Turning and holding the switch fully clockwise to the 90° position will energize the cranking motor. When the key switch is released it will return to the off position.

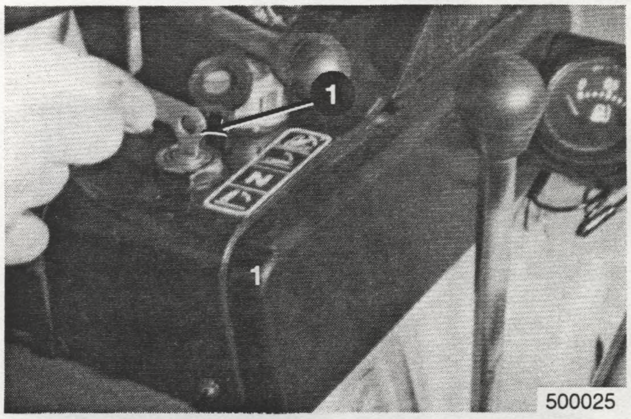


Figure 5: Steel Style Instrument Panel

Turning the switch to the "mid" (45°) position on tractors with this style dash will energize the instrument panel electrical circuits. Turning and holding the switch fully clockwise to the 90° position will energize the cranking motor. When the switch is released it will return to the mid position.

NOTE: *The glow plug or fuel flame preheater on this style instrument panel is on a separate switch.*

IMPORTANT: *Turning the key switch to the "off" position on either style instrument panel will not shutdown the engine. Engine shutdown is accomplished by closing the engine throttle.*

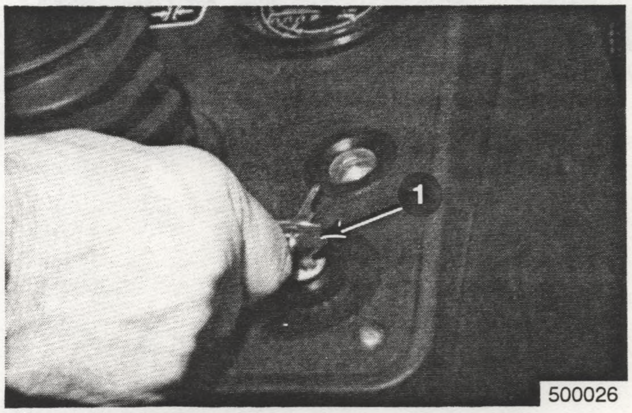


Figure 6: Fiberglass Style Instrument Panel

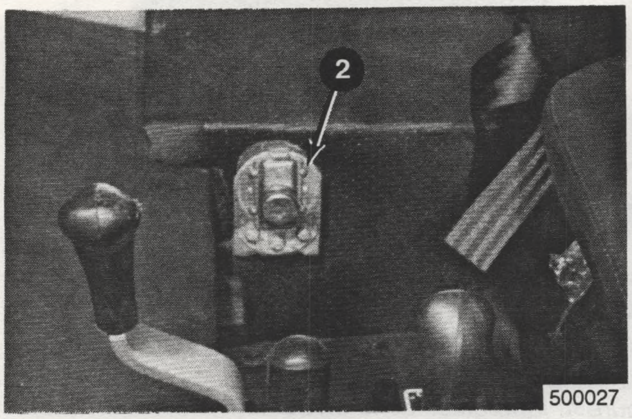


Figure 7: Ground Lockout Switch

GROUND LOCKOUT SWITCH (2)
The ground lockout switch is located in the lower right rear corner of the operators station and is used to open or close the battery primary ground circuit. When this switch is in the "open" position, electrical power is removed from all electrical circuits, including the starting circuit.

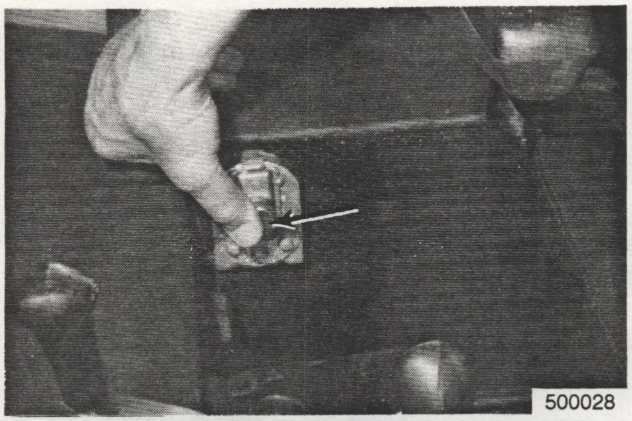


Figure 8: Close Button

To close the switch, push inward firmly on the button of the switch until the switch is latched in the closed position.

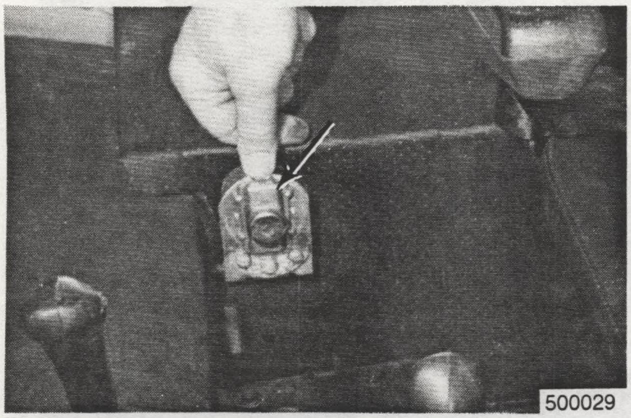


Figure 9: Release Latch

To open the switch and remove electrical power, push downward on the upper spring load release lever on the top of the switch.

NOTE: *Whenever the tractor is shutdown and parked, the switch must be in the "open" position to prevent battery discharge through the alternator windings and to discourage unauthorized tractor operation.*

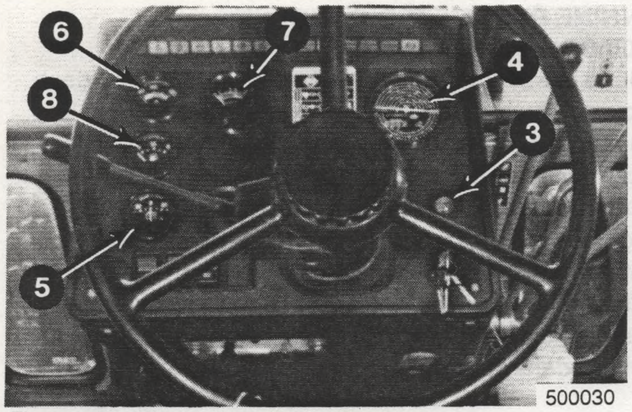


Figure 10: Fiberglass Style Dash

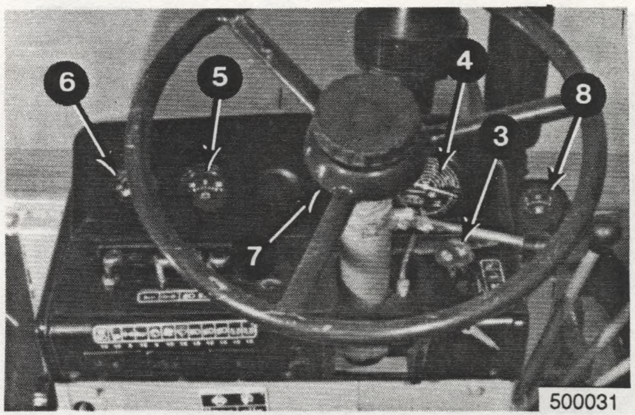


Figure 11: Steel Style Dash

ENGINE PREHEATER INDICATOR (3)

This indicator lamp will glow red when the engine preheat switch is energized. The lamp will glow red in proportion to glow plug or fuel flame heater element heating. When the lamp glows bright red it indicates the starting circuit should be energized. **Do not** energize longer than 30 seconds.

TACH-SPEEDOMETER/HOURMETER (4)

The hourmeter indicates the actual hours that the engine has run (up to 9999). It is the most reliable method of determining maintenance intervals of the tractor. The tachometer indicates engine speeds in revolutions per minute (lower scale) and approximate travel speeds. The dial of the tachometer has graduations of 100 RPM.

AMMETER GAUGE (5)

The ammeter indicates the charging rate of the alternator. When the engine is first started, the gauge should indicate a higher charge rate which should decrease as the batteries become fully charged. If the ammeter gauge indicates a discharge condition (in the left hand band from zero) with the engine running it means the alternator is not producing enough voltage to supply the applied load or is not charging at all. If the ammeter needle registers a continuous high charging rate (in the right hand band from zero) this indicates the alternator is overcharging and is not regulating correctly. If either of the above conditions exists, contact your dealer for service.

IMPORTANT: *Always check alternator drive belt condition and tension whenever a no charge condition is indicated on the ammeter.*

COOLANT TEMPERATURE GAUGE (6)

The engine coolant temperature gauge will indicate the coolant temperature in degrees Celsius. Normal engine operating temperature should be 75° - 100° C (167° - 212° F) and should register in the green band of the gauge. If the gauge indicates an over heating condition, correct the cause before continued operation. Overheating may be caused by low coolant level, overloading, loose fan belt or a plugged radiator.

NOTE: *Overheating may also be caused by the radiator shutter curtain being raised.*

OIL PRESSURE GAUGE (7)

Use this gauge to monitor engine oil pressure during operation. Normal oil pressure should be in the green band (1.0 - 4.0 Kg/cm^2) when the engine is at normal operating temperature. The engine should not be operated in the white or red zones of the gauge at rated engine speed. If little or no oil pressure is indicated on the gauge, shut down the engine immediately and correct the cause.

FUEL LEVEL GAUGE (8)

The fuel gauge will indicate the approximate volume of fuel remaining in the tank. Never allow the fuel tank to run dry.

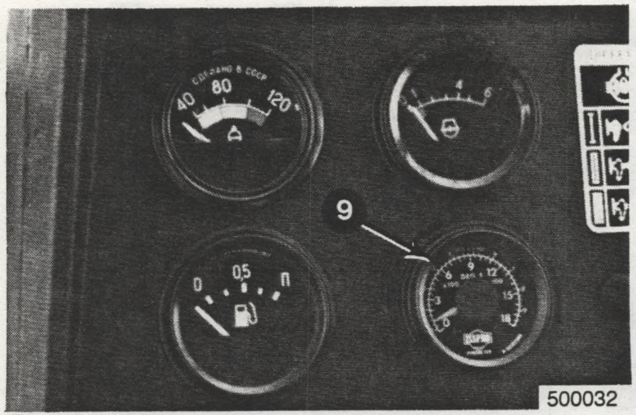


Figure 12: Pyrometer

ENGINE PYROMETER GAUGE (9) (900 Series Tractors Only)

900 series tractors are equipped with a dash mounted pyrometer gauge to measure engine exhaust temperature during operation. Normal operating exhaust temperature at rated engine rpm under load should be 900° - 1100°F (517° - 629°C). Higher than normal exhaust temperature will indicate that the engine is in a lug condition. You must either shift to a lower gear range or reduce the load. Never exceed 1250°F (712°C) during operation or severe damage may result.

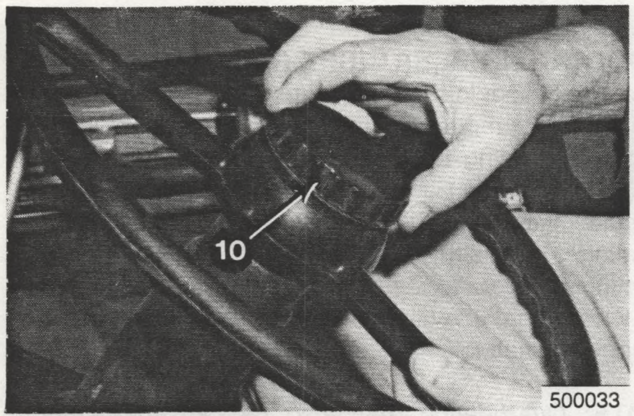


Figure 13:

STEERING WHEEL TELESCOPING CONTROL (10)

Turn the large knob in the center of the steering wheel counterclockwise and move the steering wheel up or down on the column to the desired operating position within its range of travel. Turn the knob clockwise to lock the wheel in position.

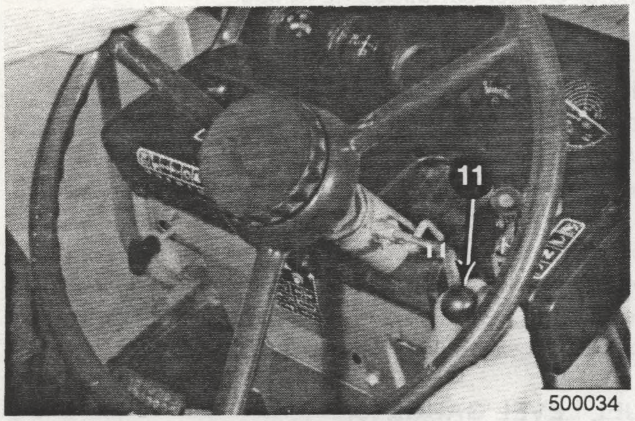


Figure 14:

STEERING WHEEL TILT CONTROL (11)

On tractor models with a steel style dash, lift upwards on this spring load lever to release and tilt the steering column to the desired operating position. Release the lever to lock in position.

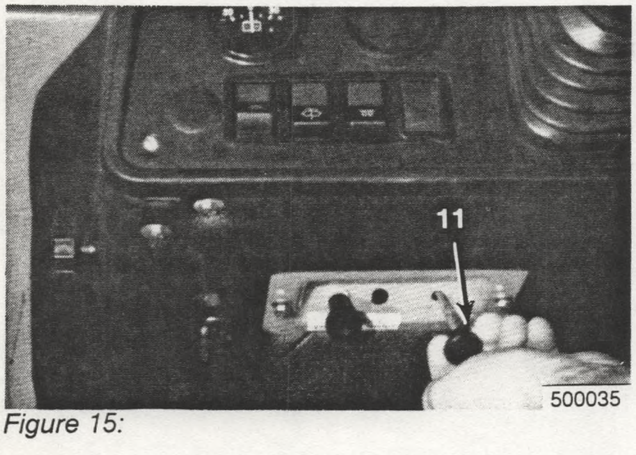


Figure 15:

On tractor models equipped with a fiberglass style instrument panel, pull outwards on the knob to tilt the steering column to the desired operating position. Release the spring loaded knob to lock in position

CENTRAL LIGHT SWITCH (12)

The central light switch on tractors with a steel style instrument panel is a 3-position push-pull type switch.

NOTE: *On the steel dash models there is a push button switch to activate the windshield washers.*

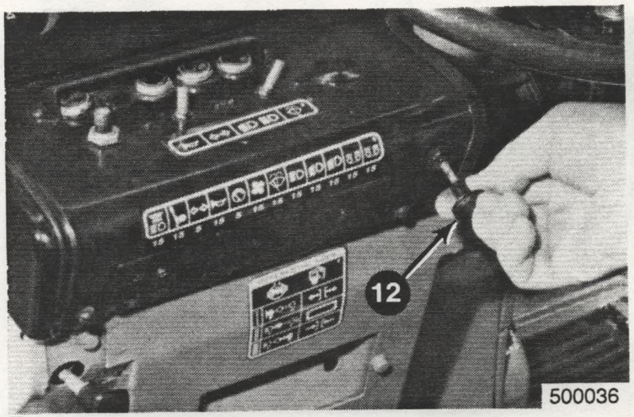


Figure 16: Light Switch

The switch used on tractors with fiberglass style instrument panels is a 3-position rocker type switch. The first position of either type switch is off, the second position is instrument panel, marker and tail lights and the third position is all lights including the front head lights.

NOTE: *Rear work (flood) lights are not controlled by these switches.*

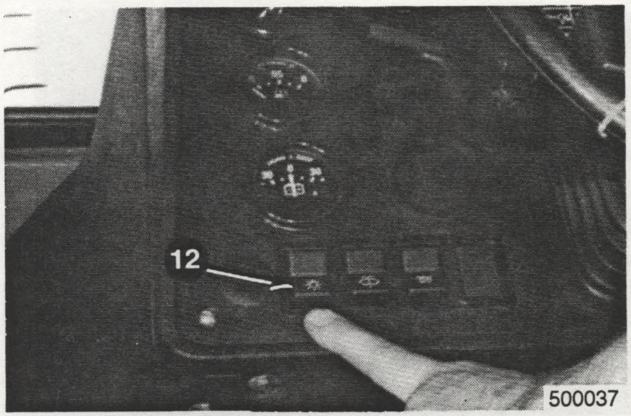


Figure 17: Light Switch

HEADLAMP HI-LO BEAM SWITCH (13)

The Hi-Lo beam switch used on tractor models with a steel style dash is a 2-position toggle type switch.

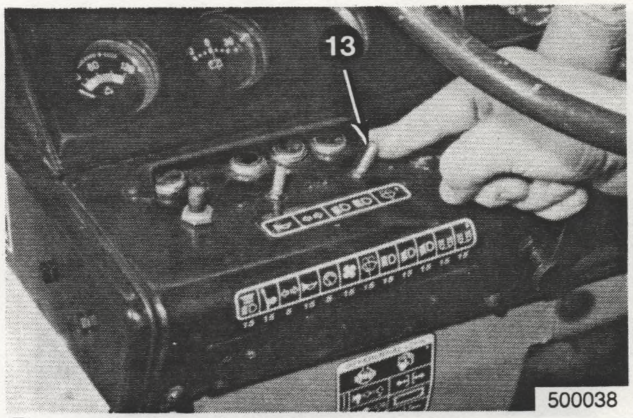


Figure 18: Hi-Lo Beam Switch

The Hi-Lo beam switch used on tractor models with a fiberglass style dash is operated by the turn signal switch actuating lever located on the steering column. Move the lever up or down vertically to switch headlamp beams.

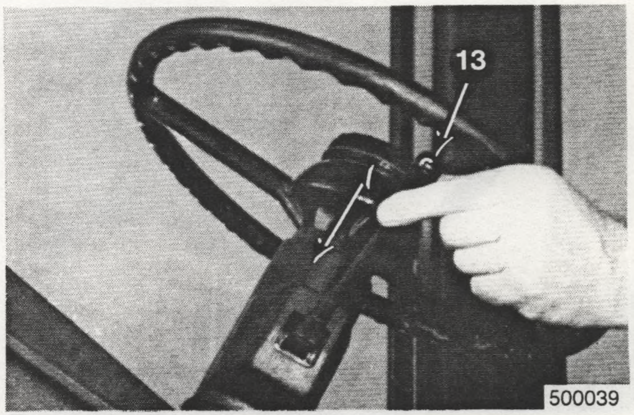


Figure 19: Hi-Lo Beam Switch

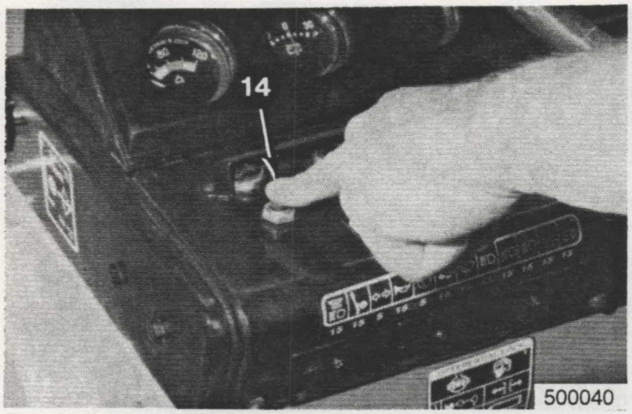


Figure 20: Horn Switch

HORN SWITCH (14)

To activate the horn, depress the button located on the dash panel for tractors with steel style instrument panels.

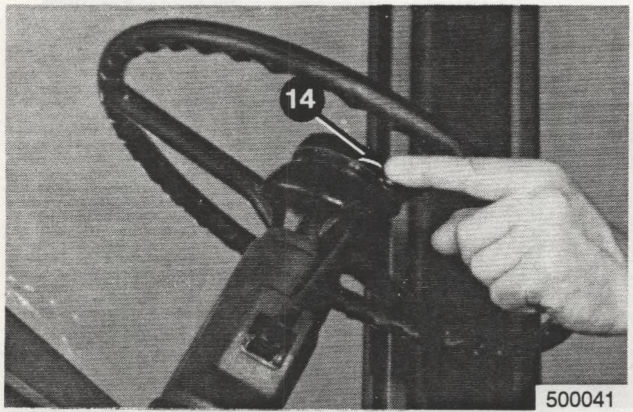


Figure 21: Horn Switch

Depress the button located on the end of the turn signal switch actuating lever for tractors with fiberglass style instrument panels.

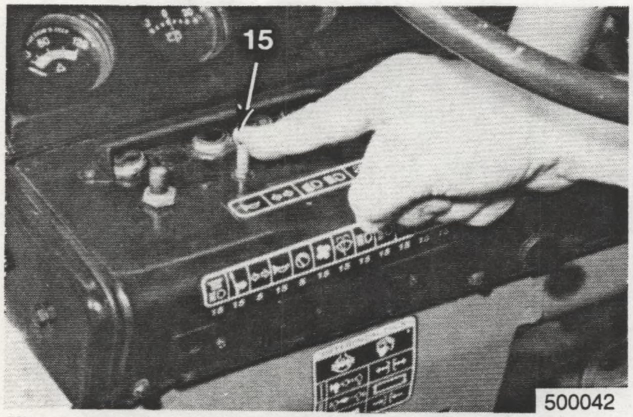


Figure 22: Turn Signal Switch

TURN SIGNAL SWITCH (15)

The turn signal switch used on tractors with a steel style dash panel is a 3-position toggle switch (left turn, off, right turn). Push the switch to the left of center for a left turn and to the right of center for a right turn.

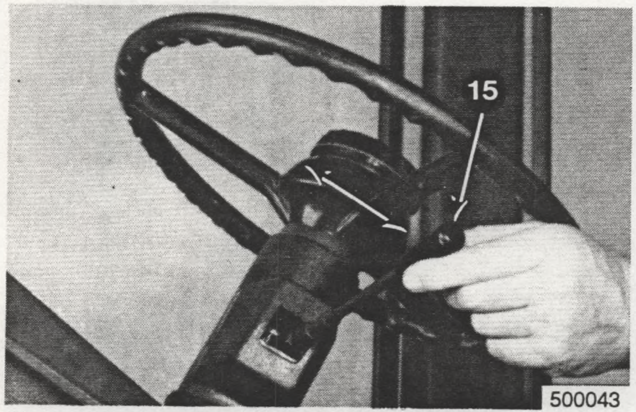


Figure 23: Turn Signal Switch

The turn signal switch used on fiberglass style instrument panels is located on the steering column. Rotate the turn signal switch handle upward for a right turn and downward for a left turn.

NOTE: *Turn signal switches are not self cancelling.*

WINDSHIELD WASHER (16)

If equipped with windshield washer, depress this rocker type switch to activate the washer.

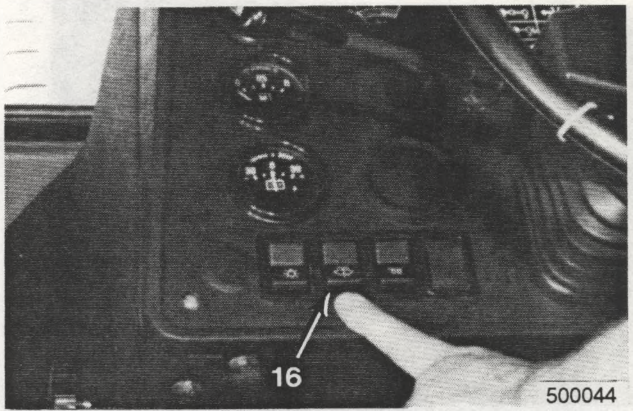


Figure 24: Washer Switch

ENGINE PREHEATER SWITCH (17)

Tractors with the fiberglass style instrument panels have a rocker type switch to energize the engine glow plugs or flame heater when operating in cold ambient temperatures (32°F and below) for easier engine starting. Depress and hold the switch until the preheat indicator lamp element glows bright. **Release** the switch and immediately turn the key start switch to crank the engine.

IMPORTANT: *Always release this switch before cranking the engine to prevent overloading the electrical circuit wires. Do not depress this switch while cranking the engine.*

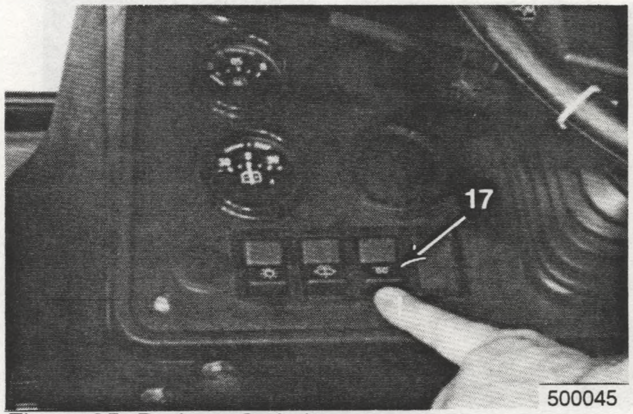


Figure 25: Preheat Switch

WINDSHIELD WIPER (18)

Depress the switch located in the overhead console to activate the front windshield wiper.

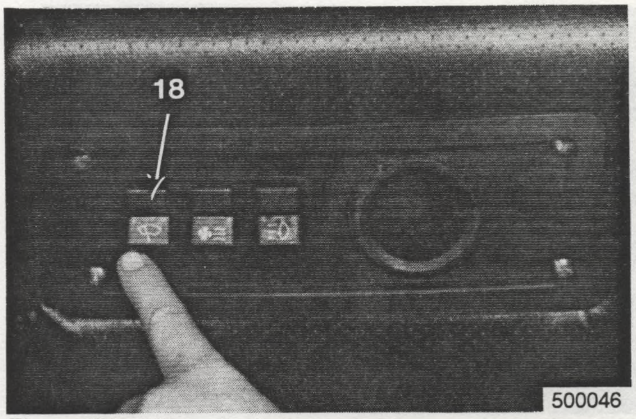


Figure 26: Wiper Switch

CAB BLOWER (19)

Depress the switch located in the overhead console to activate the cab blower for heating or pressurizing the cab.

NOTE: *Operate the cab blower at low speed to pressurize the cab.*

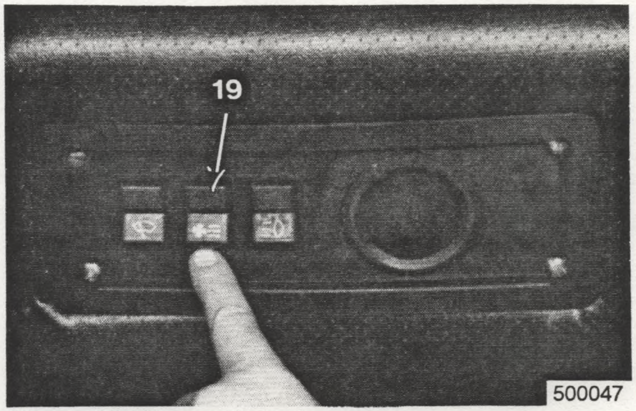


Figure 27: Blower Switch

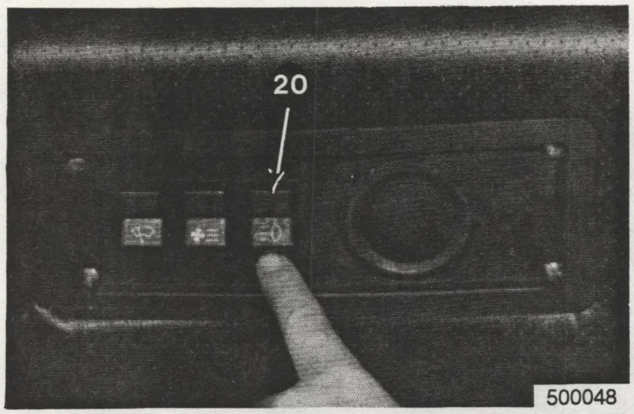


Figure 28: Rear Light Switch

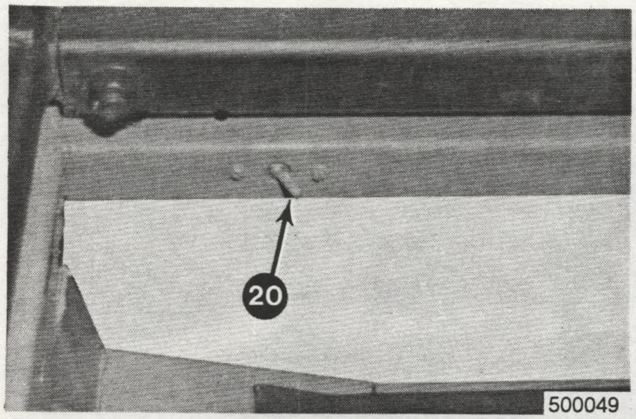


Figure 29: Rear Light Switch

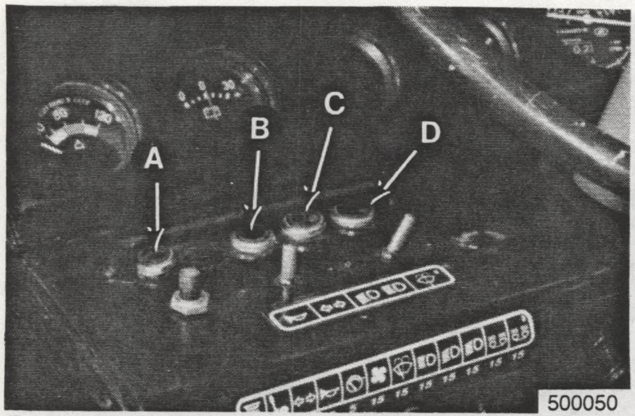


Figure 30: Indicator Lamps

REAR WORK (FLOOD) LAMPS (20)

If your tractor is equipped with ROPS cab, depress the rocker switch located in the left side of the overhead console to turn the rear work lights on or off.

On tractor models without a cab, use the on-off toggle switch located at the lower right rear corner just behind the operators seat.

CAUTION: Do not use rear work lights when traveling on public roadways after dark.

INSTRUMENT PANEL INDICATOR LAMPS (Steel Style Dash)

a. **Ground Lockout Switch Indicator:** This red lamp will illuminate when the ground lockout switch is in the closed position and the engine is stopped (provided 12 volt battery power is available). The lamp will go out when the engine starts. If the lamp illuminates during operation, it may indicate a loose or broken fan belt or faulty alternator.

b. **Turn Signal Indicator:** This green lamp will flash on and off when the turn signal switch is turned on for a left or right turn.

c. **High Beam Indicator:** This blue lamp will illuminate when the headlamps are switched to high beam.

d. **Park Brake Indicator:** This red indicator lamp will illuminate whenever the park brake is applied.

INSTRUMENT PANEL INDICATOR LAMPS (Fiberglass Style Dash)

a. **Engine Air Filter Restriction:** This amber colored lamp will glow if the engine air filter reaches its maximum allowable restriction during operation. When this lamp illuminates the air cleaner requires service.

b. **Engine Coolant Temperature:** If engine coolant temperature rises above safe operating limits this red indicator lamp will illuminate.

c. **Engine Oil Pressure:** This red indicator lamp will glow if engine oil pressure falls below safe operating limits during operation.

NOTE: *This lamp will also illuminate when the engine is stopped and the key switch is turned to the first (45°) position indicating the ground lockout switch is closed.*

d. **Amber Lamp:** Not used.

e. **Amber Lamp:** No used.

f. **Red Lamp:** Not used.

g. **Headlamp Hi Beam Indicator:** This blue lamp will illuminate when the headlamps are switched to the high beam.

h. **Amber Lamp:** Not used.

i. **Red Lamp:** Not used.

j. **Turn Signal Indicator:** This green indicator lamp will flash on and off when a left or right turn is selected.

k. **Green Lamp:** Not used.

l. **Park Brake Indicator:** This red lamp will flash on and off when the park brake is applied.

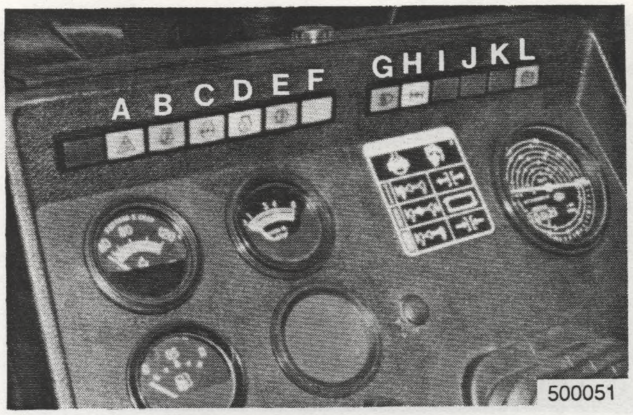


Figure 31: Indicator Lamps

INDICATOR LAMP BULB TEST SWITCH

On tractor models equipped with a fiberglass style instrument panel a test switch is provided to test the indicator lamp bulbs. Depress the switch button located on the outer end of the left side indicator light bank. All indicator lights in this bank should illuminate when the switch is depressed.

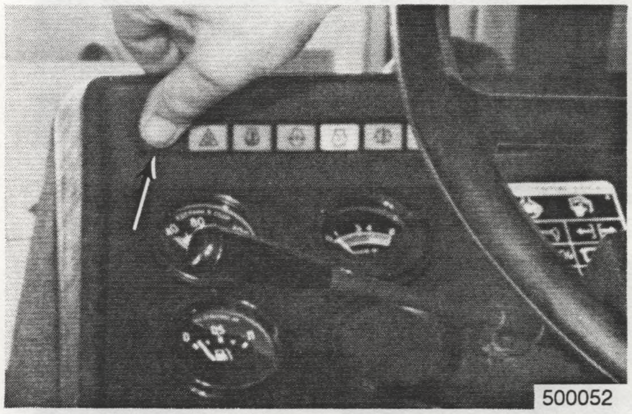


Figure 32: Left Side Test Switch

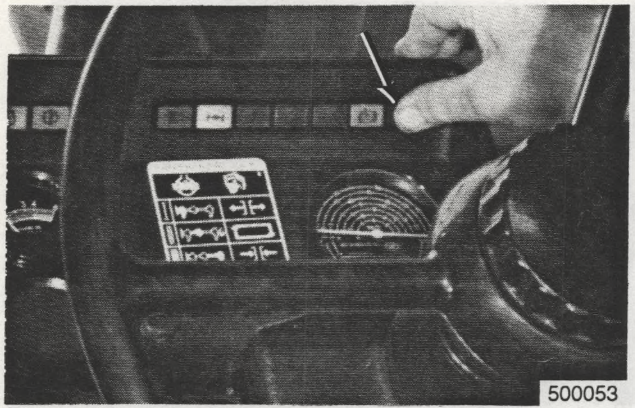


Figure 33: Right Side Test Switch

Depress the switch button located on the outer end of the right side indicator light bank. Replace any bulbs that do not illuminate during this test.

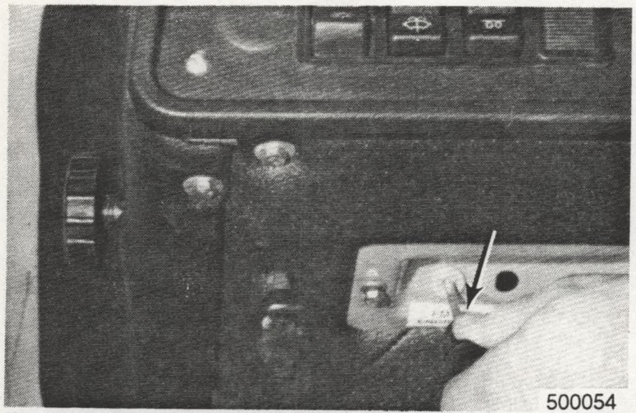


Figure 34: Engine Stop

EMERGENCY ENGINE STOP (If equipped)
Pull outward on this knob to its full extreme of travel to shut off the engine air supply if the engine must be shutdown in any emergency situation. The knob must be pushed in before restarting.

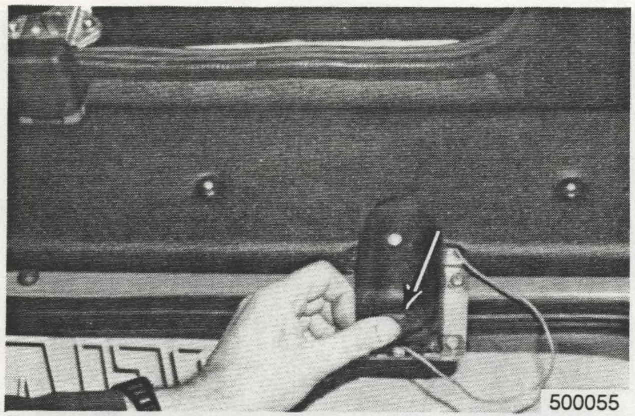


Figure 35: Rear Wiper Switch

REAR WINDOW WIPER (If equipped)
Depress the switch located on the bottom of the rear wiper motor to start or stop the rear window wiper.

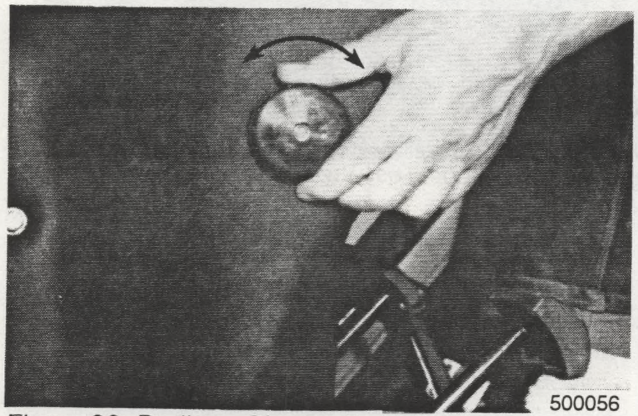


Figure 36: Radiator Shutter Control

RADIATOR SHUTTER CONTROL
The tractor is equipped with a shutter curtain that can be raised or lowered in front of the radiator for use during cold weather operation. Turn the large hand knob on the left side of the dash console clockwise to raise the curtain and reduce air flow through the radiator. Push inward, and turn the knob counterclockwise to release and lower the curtain.

IMPORTANT: *Always lower the curtain during warm weather operation to prevent engine overheating.*

DIFFERENTIAL LOCK CONTROL
The rear differential interlock control can be set into one of three positions; disengaged, automatic, or forced.

When the control is pushed fully in to the first position the interlock is disengaged (off).

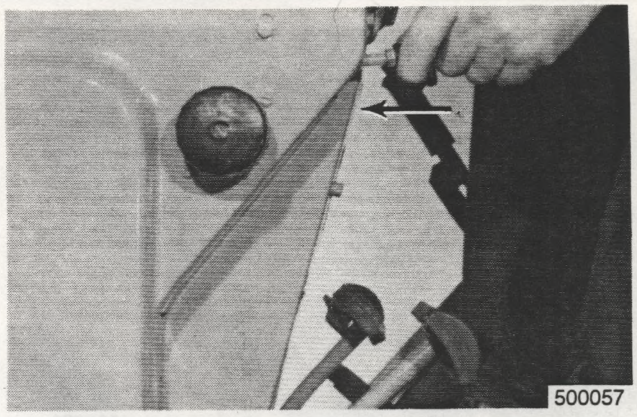

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Figure 37: Off Position

When the control knob is pulled out midway and turned 90° clockwise, the differential lock is automatically engaged for field work.

NOTE: *When the control is in the mid-position (automatic) the differential lock will disengage whenever the front wheels are turned beyond 10° left or right of center.*

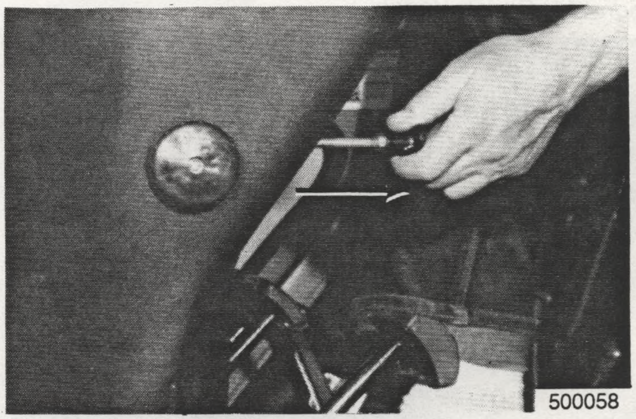
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Figure 38: Mid Position

When the control knob is turned 90° counter-clockwise and pulled all the way out and held by hand, the differential locking system is engaged manually, independent of steering wheel position. This position is used when short duration maneuverability is required in field operations. Releasing the knob will return the interlock to the off position.

WARNING: The differential interlock is intended for traction improvement in field operations only. Do not drive on roads, or at high speeds anywhere with the differential lock engaged. Difficult steering may occur and can result in an accident.

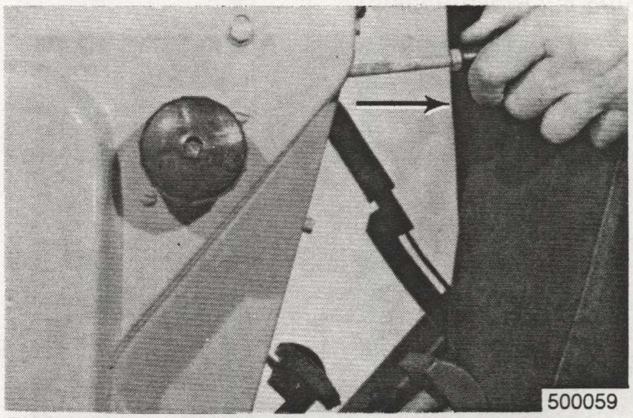
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Figure 39: Forced Position

MECHANICAL FRONT AXLE CONTROL (If equipped)
Use this control lever to engage or disengage the front wheel axle drive transmission. The tractor must be at a standstill when engaging the front wheel assist drive. The control lever has 3 positions; A, B, and C. To change lever positions, push the lever slightly to the rear to disengage the slots.

A. **Disengaged:** The latch is in the lowest slot.

B. **Automatic Engagement:** Free running clutch is on. Use this position for standard field work.

C. **Manually Engaged:** This position is for loose/wet soil conditions or other conditions requiring short duration operation.

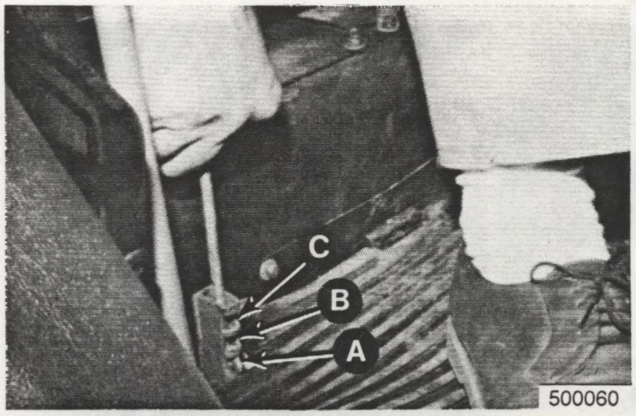

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Figure 40: Control Lever

Operating Controls and Instruments

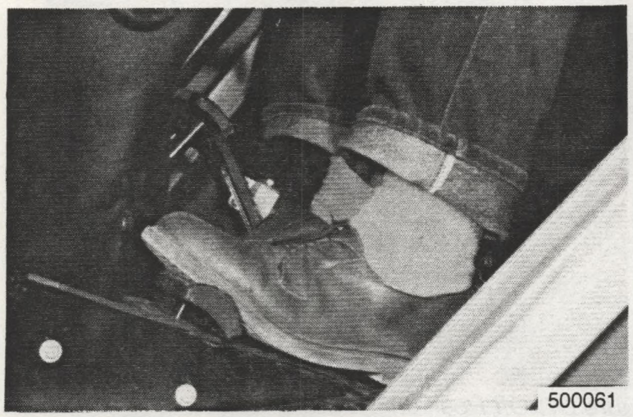

Figure 41: Clutch Pedal

CLUTCH PEDAL

Fully depress the clutch pedal for all transmission gear selections. Always release the clutch quickly and smoothly to engage the load. Do not "ride" the clutch pedal during operation or severe damage will result from slipping and overheating. To extend clutch life do not release the clutch against a dead load and high engine speed.

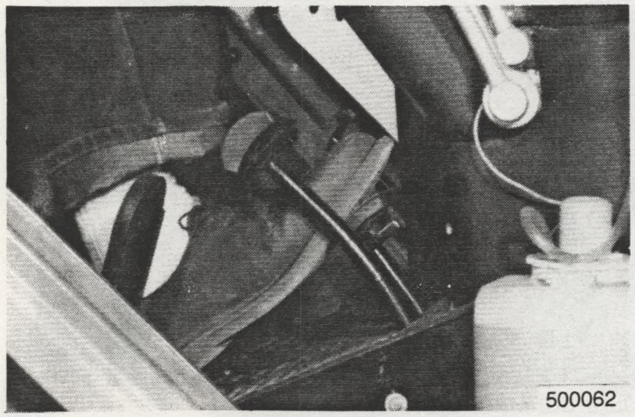

Figure 42: Brake Pedals

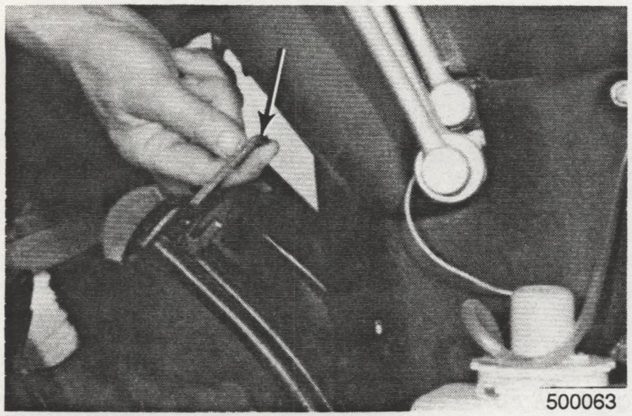

Figure 43: Brake Pedal Interlock

LEFT AND RIGHT BRAKE PEDALS

The left hand brake pedal stops the left rear wheel and the right hand brake pedal stops the right rear wheel. Use the brake pedals independently for turning assistance in low speed field operations.

For safe operation on roads and/or high speed operations use the pedals together. Use the brake pedal interlock to lock both brake pedals together for simultaneous application of both rear brakes for increased stopping power. Do not "ride" the brake pedals during operation. When applying the brakes, depress the pedals gently and depress the pedals as far as they will go.

CAUTION: Brake pedals must be locked together for road or high speed travel. This will help ensure uniform brake application and maximum stopping ability. Extra weight and poor traction conditions such as ice or mud increase your stopping distance.

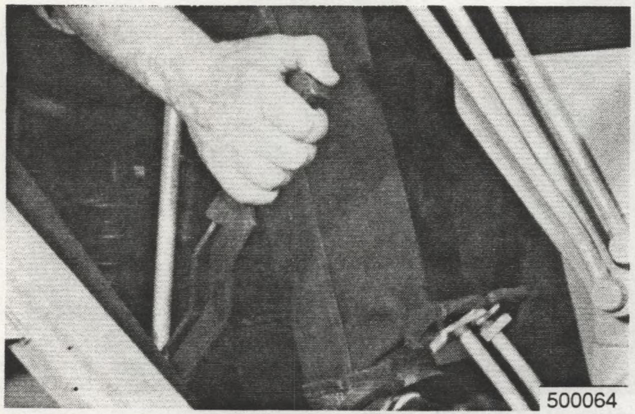

Figure 44: Park Brake

PARK BRAKE HAND LEVER

Pull rearward firmly on this lever to apply the parking brakes. Pull rearward and depress the release button on top of the lever to release the park brake. Always apply the park brake whenever leaving the operators seat.

WARNING: Do not use the park brake to stop a tractor in motion except in emergency situations in case the main brake fails.

IMPORTANT: *Do not push or tow the tractor if the park brake is engaged or severe transmission damage may result.*

FOOT OPERATED ENGINE THROTTLE
The foot throttle and hand throttle are connected together. When the foot throttle is depressed it will override the hand throttle setting to increase engine speed. when the foot throttle is released, the engine speed will slow to that set by the hand throttle.

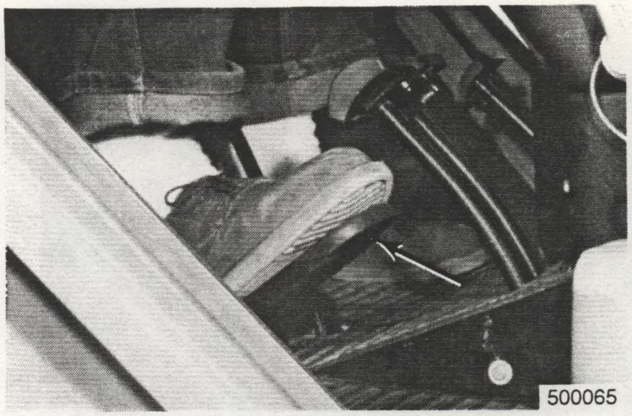

Figure 45: Foot Throttle

ENGINE THROTTLE HAND LEVER
The hand throttle lever is used to control engine speed and to shut down the engine. To increase engine speed, move the lever forward. To slow the engine speed move the lever rearward. **Move the lever fully rearward to shut down the engine.**

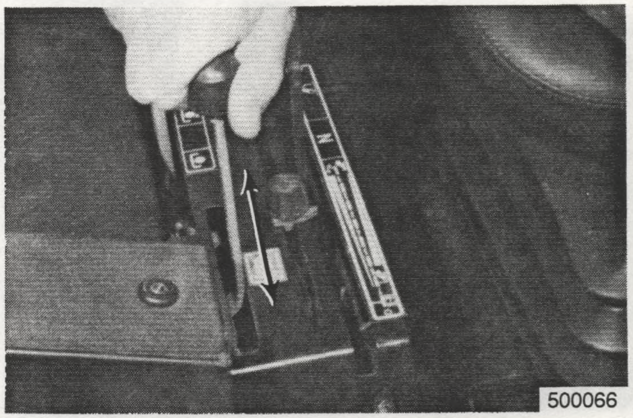

Figure 46: Hand Throttle

TRANSMISSION RANGE SHIFT LEVER
Use this lever to select transmission Hi or Lo range and all forward or reverse gears. Depress the clutch pedal completely before attempting to shift gears at all times whether the engine is running or not.

NOTE: *All tractor motion must be stopped before shifting gears. See Operating Instructions for shifting procedures.*

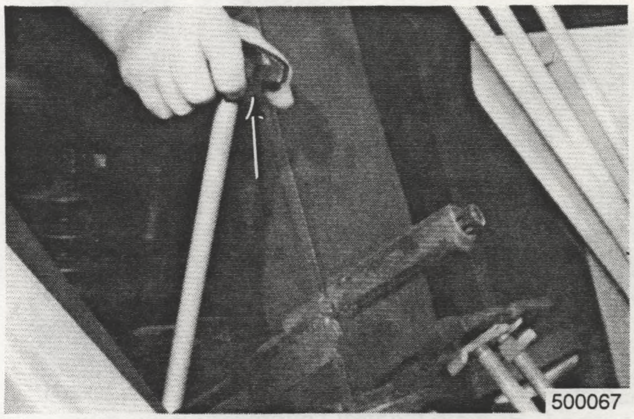

Figure 47: Shift Lever

TRANSMISSION SPEED REDUCER
(If equipped)
The speed reducer doubles the number of transmission forward and reverse gear ratios available (refer to Travel Speed Chart). Move the speed reducer shift lever forward to engage the high gear ratio. Move the lever rearward for the low gear ratio.

IMPORTANT: *Do not attempt to shift on the go. The tractor must be at a complete standstill before changing gear ratios.*

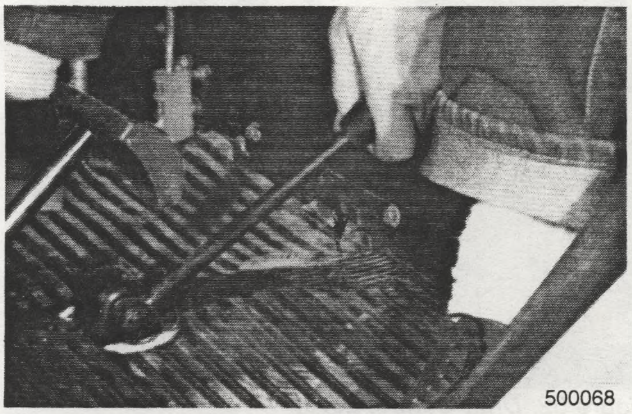

Figure 48: Speed Reducer Shift Lever

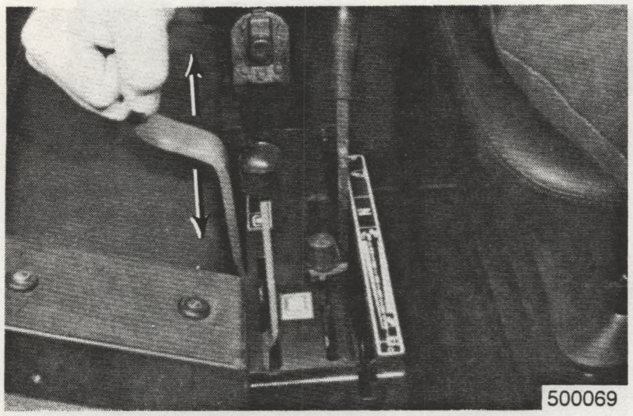

Figure 49: PTO Control Lever

REAR PTO CONTROL LEVER

Use this lever to engage or disengage the PTO shift. Move the lever rearward to engage the PTO. Move the lever forward to disengage the PTO shaft.

NOTE: *Depressing the clutch pedal will not stop the PTO shaft. Move the PTO control lever forward to disengage and stop PTO shaft rotation.*

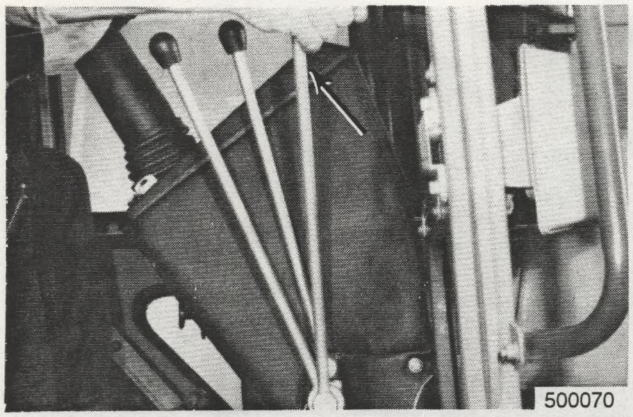

Figure 50: Hitch Control Lever

THREE POINT HITCH CONTROL LEVER

The outer right control lever controls the hitch cylinder. The standard hitch control valve has four detent positions; raise, neutral, lower and float. The float position of the valve allows implements with gauge wheels to follow ground contours.

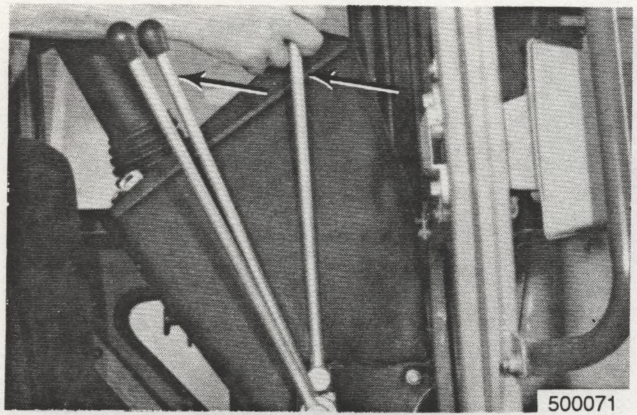

Figure 51: Remote Control Levers

REMOTE HYDRAULIC CONTROL LEVERS

The middle and left side control levers control the flow of oil through hydraulic outlets located at the rear of the tractor and on the left and right side of the engine.

The control valve levers are detented in four positions; raise, neutral, lower and float with hydraulic kick-out in the raise and lower positions.

NOTE: *The left side coupler outlet is interconnected with the rear outlet.*

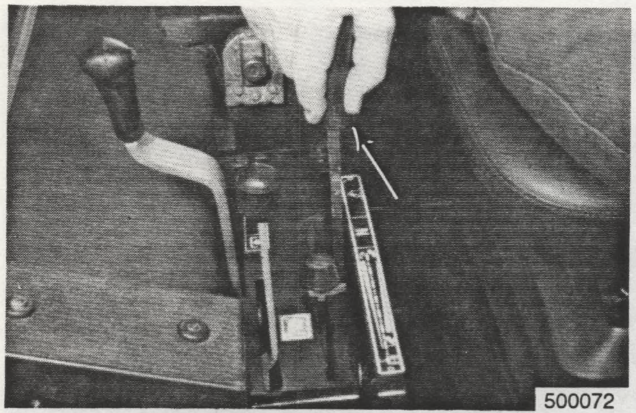

Figure 52: Draft Control Lever

HITCH DRAFT AND POSITION CONTROL LEVER

The hitch draft and position control lever is located to the right of the operator. The lever has three positions; raise, neutral and variable lower.

this control handle is used to select and preset tillage depth for repeatable and consistent operation of either the draft or position control mode of operation. See Operating Instructions for detailed information on hitch operation.

IMPORTANT: *For standard hitch operation with the main cylinder control lever, this lever must be in the "Neutral" position.*

HITCH REGULATOR VALVE

Your tractor is equipped with a hitch regulator valve located under the floor pan beneath the operators seat. Access to the valve is made by removing the hand hole cover located on the floor just in front of the seat.

The desired mode of hitch operation (draft, position or combination) is selected by a detent control knob located on the regulator valve. Hitch sensitivity is also adjusted by a lever located on the regulator valve. See Operating Instructions for detailed operating information.

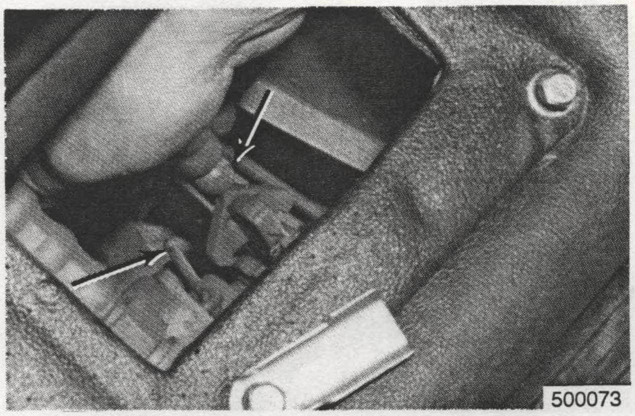

Figure 53: Regulator Valve

HYDRAULIC PUMP SHIFT LEVER

Use the lever located on the right side of the tractor to engage or disengage the hydraulic pump.

Pull outward on the lever handle and move the handle down to the second detent position to disengage the pump. Move the handle up to the first position to engage the pump.

The hydraulic pump may be disengaged during periods when the hydraulic system is not required or to reduce engine load, as an aid for cold weather starting.

IMPORTANT: *The engine must be shut down before engaging the hydraulic pump.*

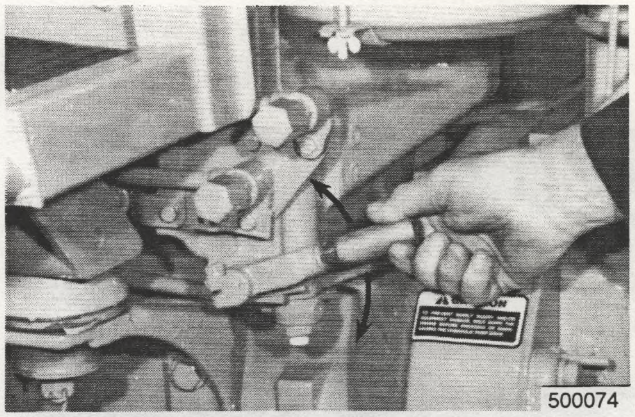

Figure 54: Hydraulic Pump Shifter Lever

HITCH TRANSPORT LOCK

A locking mechanism is supplied with the hitch system to lock the hitch in the raised position when transporting hitch mounted implements.

To engage the hitch transport lock, raise the hitch fully up. Push downward on the control handle located behind the operator. To release the lock, raise the hitch fully up to relieve any pressure against the lock and pull upwards on the control handle.

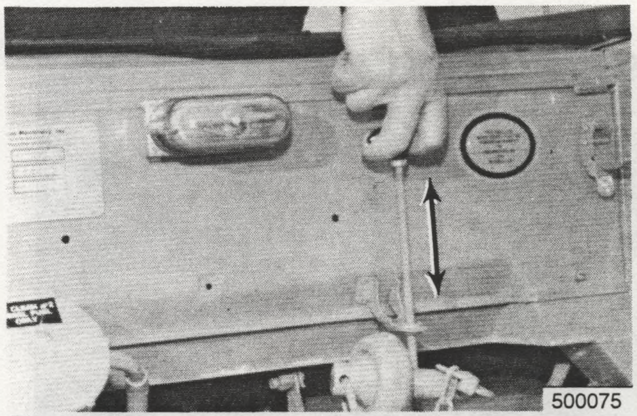

Figure 55: Transport Lock Control Handle

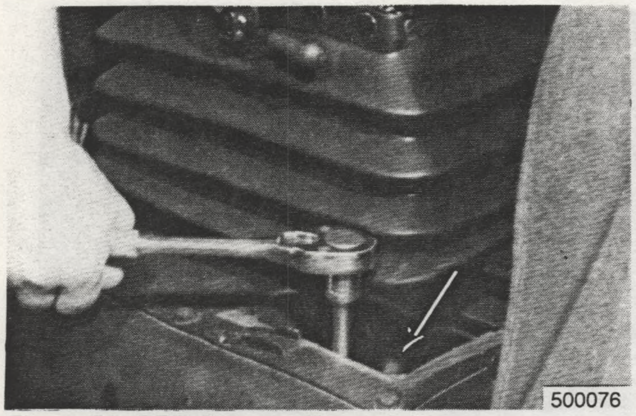

Figure 56: PTO Selector Control

INDEPENDENT OR SYNCHRONIZED PTO SPEED SELECTOR

Your tractor is equipped with a selectable independent (live) or synchronized (ground) speed PTO system.

To select independent or synchronized PTO shaft speed, remove the hand hole cover located on the floor pan ahead of the operators seat. Use an M22 socket wrench to turn the carrier shifter clockwise until it locks in position for independent drive. Turn the shifter counterclockwise until it locks in position for synchronized PTO shaft speed (3.5 revolutions per meter of travel).

IMPORTANT: *The engine must be shut down before shifting the speed selector. If necessary, "bump" the key start switch to mesh and engage the shifter carrier.*

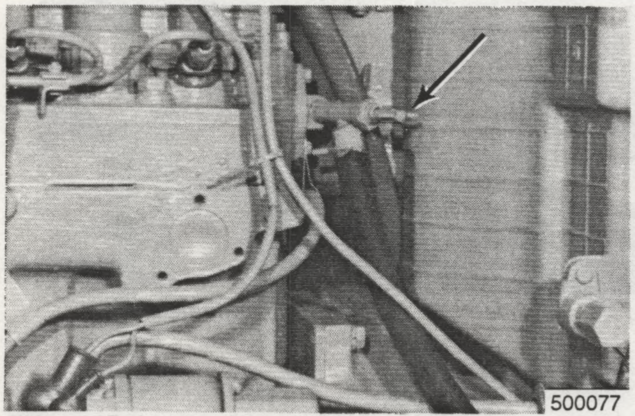

Figure 57: Heater Shut-Off Valve

CAB HEATER VALVE

When operating in cold ambient temperatures and cab heat is desired, open the valve located on the rear of the engine. This will allow engine coolant to circulate through the cab overhead heater coils. Close this valve when operating in warm ambient temperatures when only cab pressurization and air circulation is required.

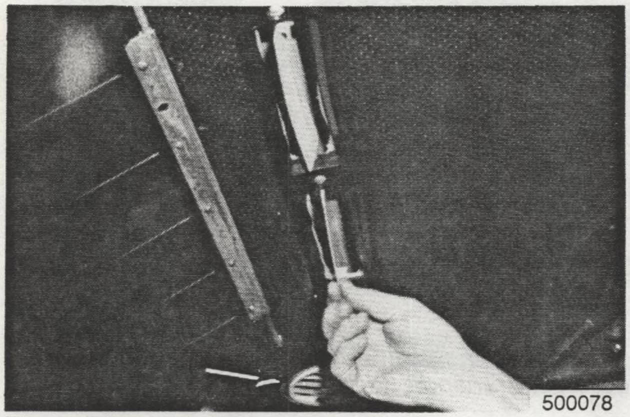

Figure 58: Air Deflectors

CAB BLOWER OUTLET

Cab pressurizer and heater blower outlets are located under the overhead console. Adjust the air outlet deflectors as needed for your comfort.

AIR CONDITIONER CONTROLS (If equipped)

If your tractor is equipped with an air conditioner system, a 3-speed evaporator blower motor switch and a temperature (thermostat) switch are located in the upper right side of the cab. To operate the air conditioner system, turn the evaporator blower switch fully clockwise to the high speed position.

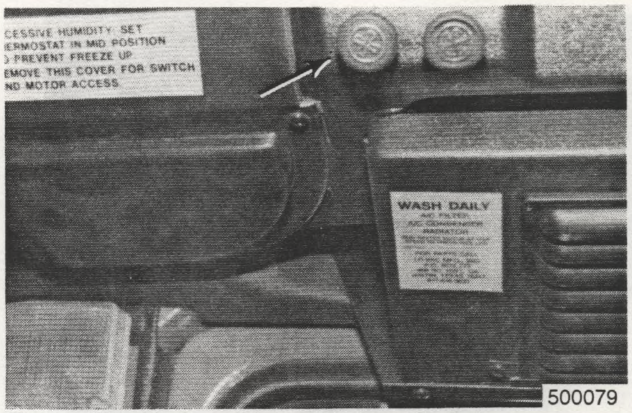

Figure 59: Air Conditioner Blower Switch

Turn the temperature (thermostat) control switch fully clockwise to start the air conditioner compressor operation.

After initial cab cool down, turn the temperature control switch counterclockwise to the mid position and the blower switch to the "Med" blower speed position for normal operation.

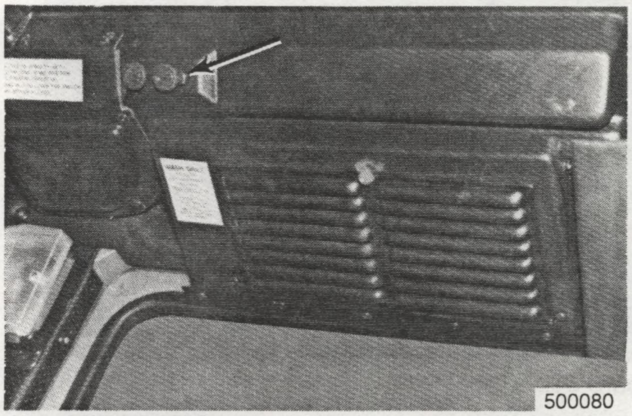

Figure 60: Thermostat Switch

IMPORTANT: *When using the air conditioner system, operate the cab blower on Lo speed for cab pressurization. Never operate the air conditioner system with the cab doors or windows open. Keep the cab clean to prevent plugging the evaporator coil.*

NOTE: *During cold weather, on a warm day with ambient temperature above 32°F (0°C), operate the air conditioner at least once a month for a period of 10-15 minutes. This will lubricate the system and compressor seal and help prevent the loss of refrigerant.*

AIR CONDITIONER AIR OUTLETS

Turn and adjust the individual air outlets to your comfort zone during air conditioner operation.

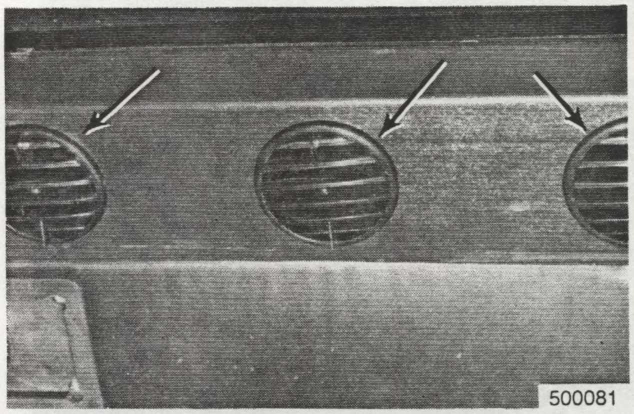

Figure 61: Air Conditioner Outlets

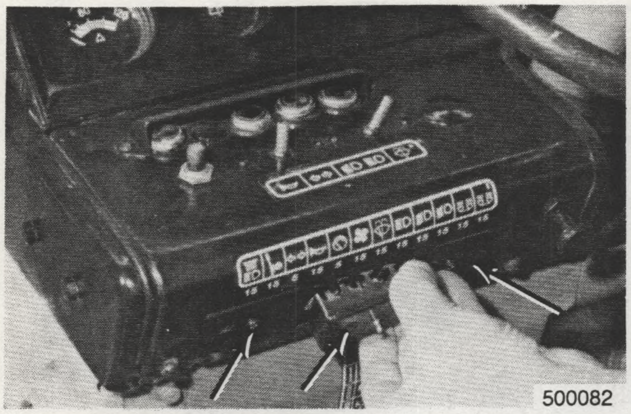

Figure 62: Fuse Boxes

ELECTRICAL CIRCUIT FUSES (Steel Style Dash)
Three electrical circuit fuse boxes are located on the front side of the steel style instrument panel. Each fuse box contains four replaceable fuses for protection of the various electrical circuits indicated on the decal. To replace the fuses loosen the screw in the center of each fuse box and remove the cover.

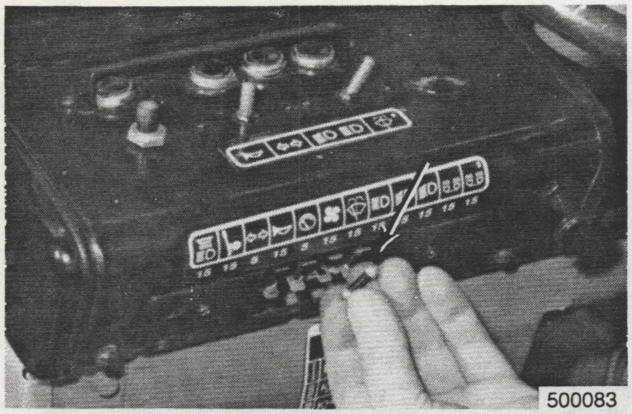

Figure 63: Fuse

Pull the fuse out of the fuse holder for replacement. Never replace a fuse with a higher amperage rating than indicated on the decal to correct a problem. If a fuse continually fails, locate and correct the problem.

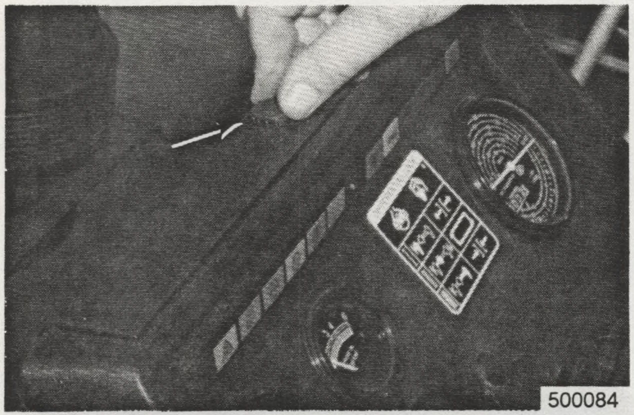

Figure 64: Fuse Cover Screw

ELECTRICAL CIRCUIT FUSES (Fiberglass Style Dash)
To access the electrical circuit fuses on this style instrument panel, loosen the cover screw on the top of the dash.

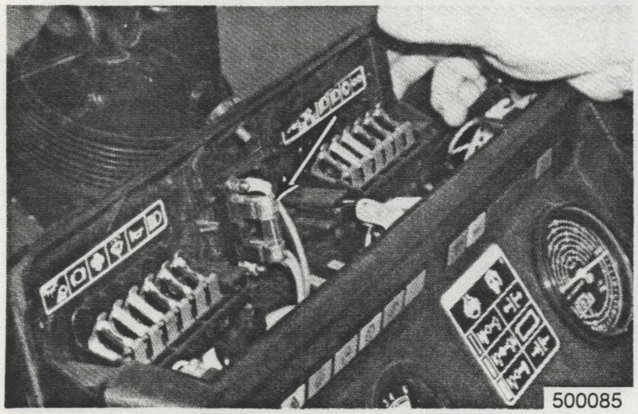

Figure 65: 50 Amp Fuse

Lift the cover to expose the electrical fuses. There are six fuses located on each side of the cover. A decal indicates each fuse electrical circuit. The large fuse in the center is a 50 amp fuse for protection of the charging circuit.

OUTSIDE REAR VIEW MIRRORS (If equipped)
Adjust and tighten the left and right side mirror mount brackets for the best possible rear vision when seated in the operators seat. Adjust and tighten the mount brackets so that the cab doors will not strike the mirrors when opened or closed.

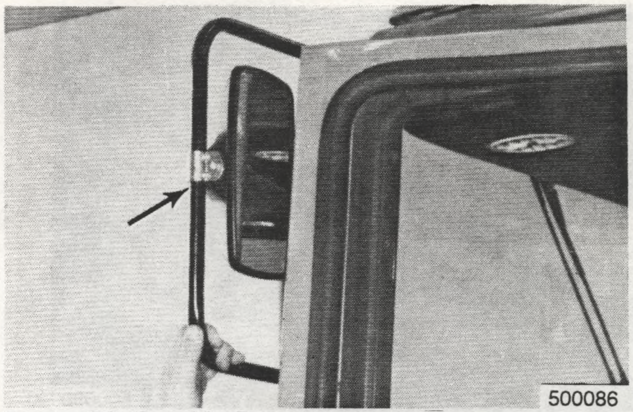

Figure 66: Outside Rear View Mirror

INSIDE REAR VIEW MIRROR (If equipped)
Adjust the inside mirror for the best possible vision to the rear when seated in the operators seat.

IMPORTANT: *Always keep the inside and outside rear view mirrors clean.*

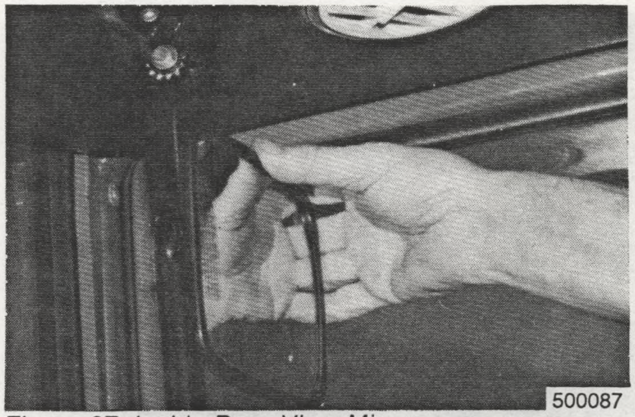

Figure 67: Inside Rear View Mirror

CAB SIDE WINDOWS (If equipped)
The tractor cab left and right side windows may be opened if desired. To open the window, lift upwards on the over-center latch handle, push downward on the handle to lock the window in the open position.

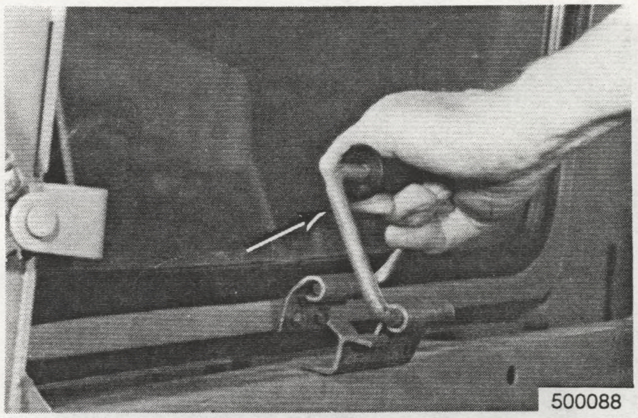

Figure 68: Side Window Latch

CAB REAR WINDOW (If equipped)
The cab rear window may be opened for additional ventilation or emergency exit if required. To open the window lift upwards on the latch handle and push outwards on the bottom of the window. Gas operated cylinders will open and hold the window.

NOTE: *This window must be opened to access the hitch transport lock latch control handle from the operators seat.*

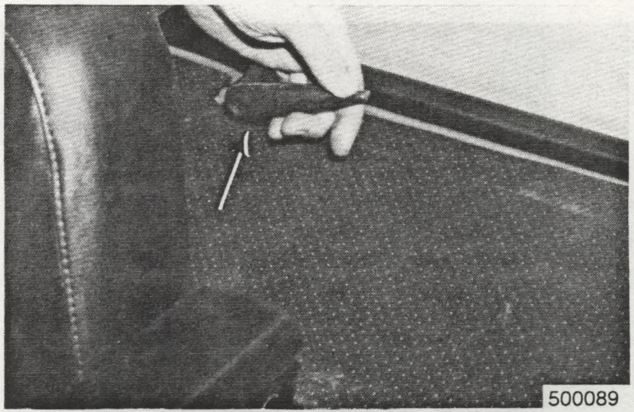

Figure 69: Rear Window Latch

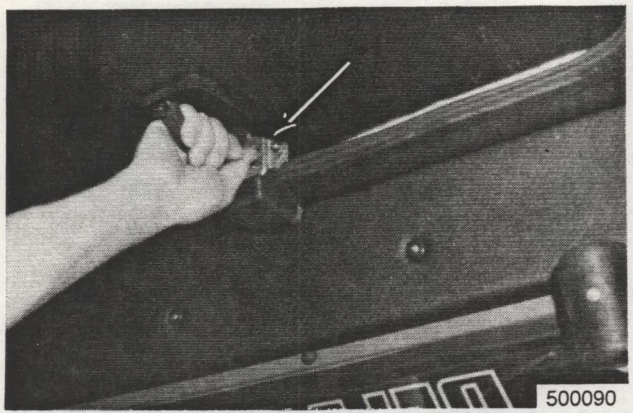

Figure 70: Cab Top Latch

CAB TOP DOOR (If equipped)

The cab top may be opened as needed for ventilation, emergency exit or cab pressurizer blower filter service. To open the cab top, grasp the handle and use your thumb to push upwards on the latch lever to release the latch. Push upwards and the top will open by the gas filled cylinders.

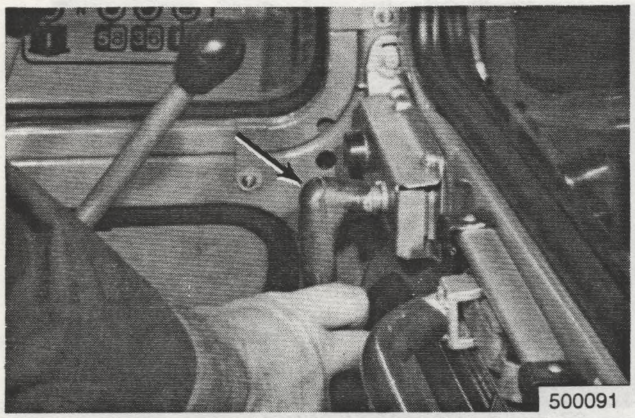

Figure 71: Door Latch

CAB DOOR LOCKS (If equipped)

If your tractor is equipped with a ROPS cab, the left cab door may be locked from the outside using a key. The doors may also be locked from the inside by rotating the latch handle down (clockwise) to engage the door locking mechanism. To open the doors, rotate the handle upwards (counterclockwise).

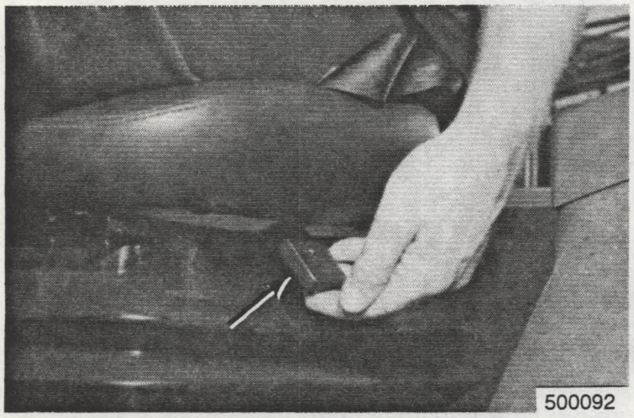

Figure 72: Fore/Aft Release

Mechanical Operators Seat

Fore and Aft Adjustment

The operators seat may be adjusted fore or aft to allow the operator the best operating position for access to controls. To release the seat pull upwards on the release lever located on the left side of the seat. Slide the seat fore or aft to the desired position and release the lever to keep the seat in the selected position.

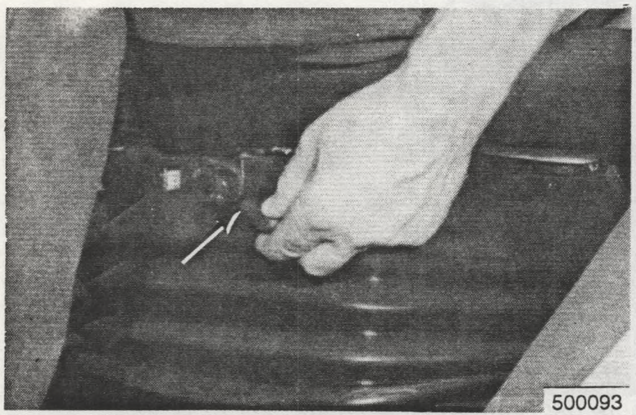

Figure 73: Ride Control

Ride Control Adjustment

The seat may be adjusted to suit the operators weight and desired operating height. Turn the control crank handle located on the front side of the seat clockwise to increase the height and weight setting. Turn the control counterclockwise to decrease the weight setting.

Using the Seat Belts

WARNING: Securely fasten your seat belt if your tractor is equipped with a ROPS cab or frame for your protection. The seat belt can help ensure your safety if it is used and maintained. NEVER wear the belt in a twisted condition or pinched between the seat structural members.

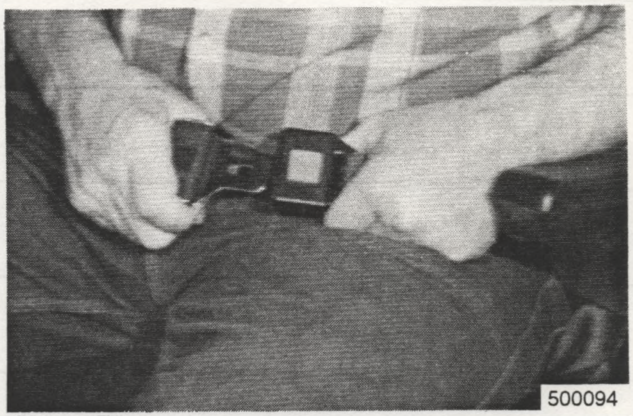
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Figure 74:

1. Adjust the seat to your requirement. Keep your back straight in the seat. Pull the seat belt across your body as low on your body as possible. Any other belt position could result in injury. Push the metal eye of the belt into the open end of the opposite belt buckle until you hear the buckle latch.

2. To prevent sliding under the belt, pull the end of the belt until the belt is tight.

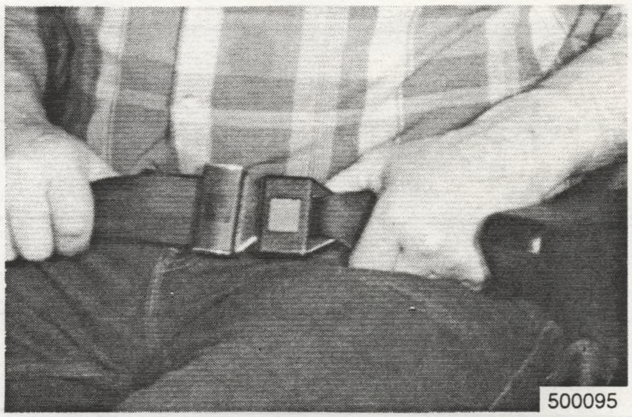
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Figure 75:

3. To release the belt, push inward on the red button in the center of the buckle to separate the buckle and metal eye.

IMPORTANT: *From time to time, carefully inspect the seat belts for worn areas and replace belts when needed.*

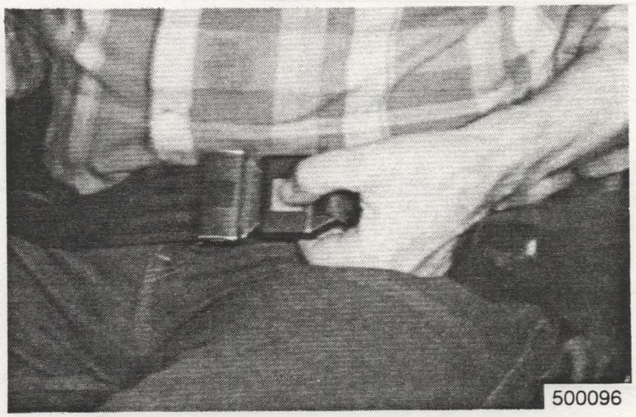
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Figure 76:

NOTES:

Study This Manual Before Operating or Servicing the Tractor

Operating instructions must be given to everyone before operating this tractor and at least once a year thereafter in accordance with OSHA regulations.

Operating Instructions

Mounting and Dismounting From the Tractor

Mount or dismount from the tractor on the left hand side

Always face the tractor when mounting or dismounting. Grip the hand holds firmly and use the steps provided whenever mounting or dismounting from the tractor.

WARNING: Only one person, the operator, should be on the tractor when operating. Start and operate the tractor only when sitting in the operators seat with the seat belt securely fastened, if equipped with ROPS. Do not permit others to ride.

New Tractor Maintenance and Run-In Requirements

The new tractor "break-in" period requires some operating procedures and maintenance intervals to differ from the normal procedures and scheduled maintenance requirements.

Before your tractor is put into heavy service, a new tractor must be given a 60 hour run-in. The tractor is assembled and tested at the factory to ensure that it is ready to work. However, the engine and drive train must be properly run-in to obtain the peak performance and long life that is built into it. A proper 60 hour run-in and maintenance will increase the power and prolong the life of your new tractor.

To properly break-in an engine merely means the engine should be operated at reduced loads for a period of time (approximately 60 hours). This will allow the piston rings to seat-in with the cylinders and form a lapped fit which would make a perfect seal between the pistons and cylinder walls.

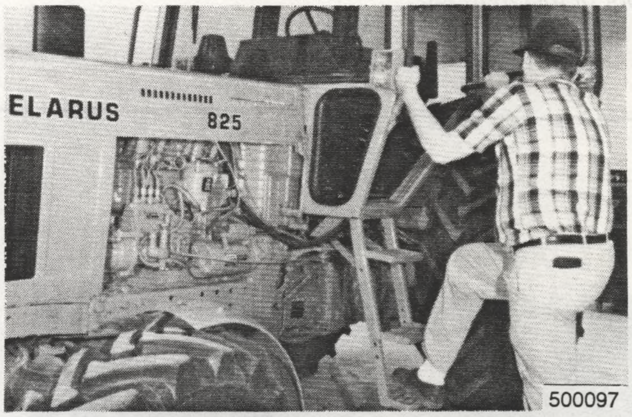


Figure 1:

The operator has an opportunity to establish conditions for optimum engine and power train service life during the initial 60 hours of service by:

1. Operating as much as possible at reduced load range.
2. Avoiding operation for long periods at engine idle speeds, or excessive lugging.
3. Developing the habit of watching the engine instruments closely during operation and reducing the throttle and/or load if the coolant temperature exceeds 200°F (93°C).

IMPORTANT: *900 Series tractors equipped with a turbocharger must not exceed 1100°F (639°C) exhaust temperatures.*

4. Operating with a power requirement that allows the engine to accelerate to governed speed when conditions require more power.

5. Checking the coolant and oil level every 8 to 10 hours during the run-in period.

6. Avoid starting and stopping a cold engine.

IMPORTANT: *After the first 60 hour tractor run-in period you must make arrangements with your Belarus dealer to have the 60 Hour Mandatory Dealer Service performed. See New Tractor Mandatory 60 Hour Service Requirement in the front of this manual.*

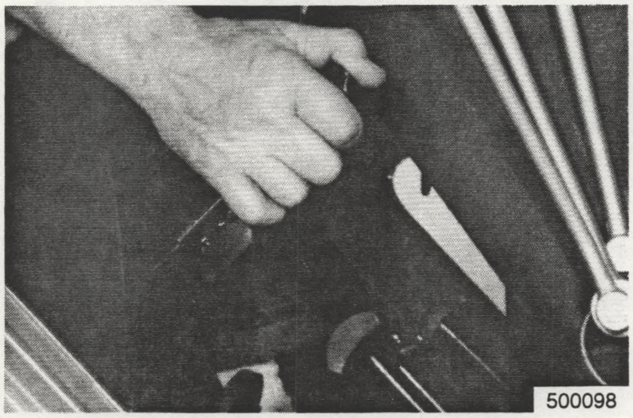


Figure 2: Park Brake

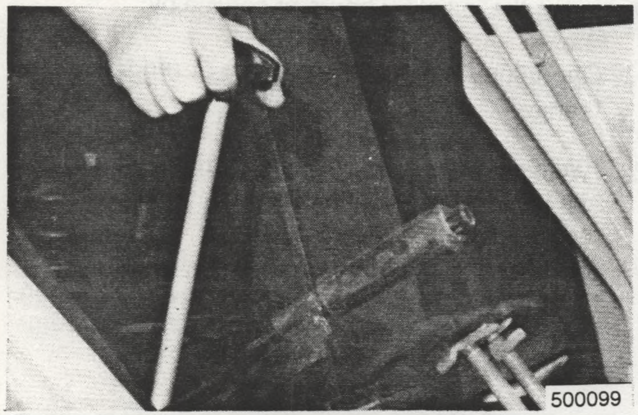


Figure 3: Transmission Shift Lever

Before Starting the Engine

Before starting your tractor for the first time, perform all required 10 hour (daily) service and maintenance requirements. See "Lubrication and Routine Maintenance" section of this manual.

Fill the fuel tank with clean No. 2 diesel fuel. Be sure that all persons that operate or do maintenance on the tractor understand that clean fuel and fuel handling equipment is important.

WARNING: To prevent injury, be sure all tractor and implement safety guards are in place before starting or operating.

Normal Engine Starting Procedure (40°F (4°C) and above)

WARNING: Operate the controls only when seated in the operators seat. If ROPS equipped, properly fasten the seat belt.

Starting Sequence:

1. Apply the park brake.

2. Put the transmission gear shift lever in neutral.

NOTE: *The tractor is equipped with a neutral start safety switch mechanism. The transmission must be in neutral for the starter to energize.*

3. Put the PTO control lever in neutral.

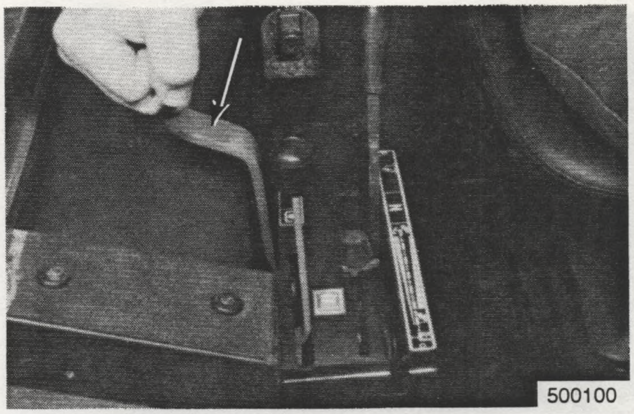


Figure 4: PTO Control Lever

4. Be sure the remote hydraulic and hitch control levers are in neutral.

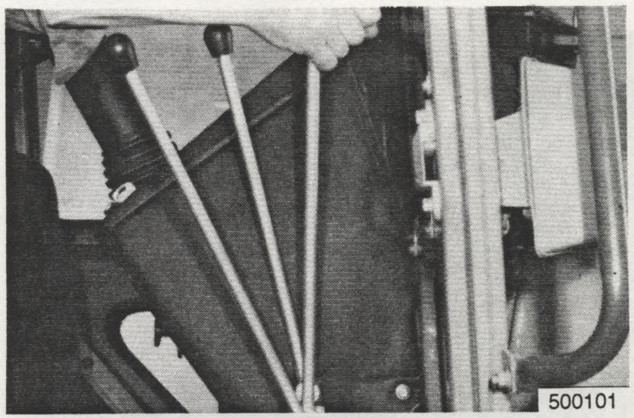


Figure 5: Hydraulic Control Levers

5. If equipped, be sure the engine emergency stop is pushed in.

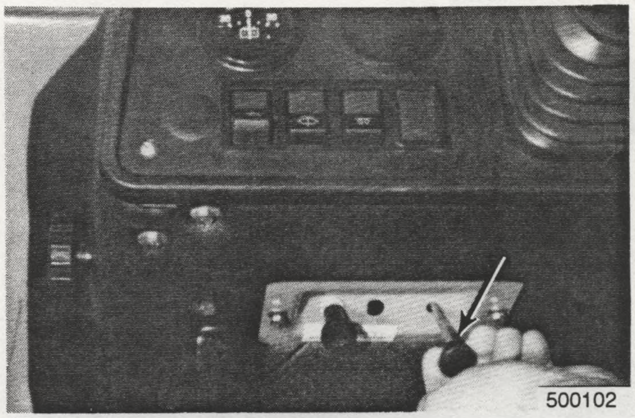


Figure 6: Emergency Stop

6. Depress the clutch pedal.

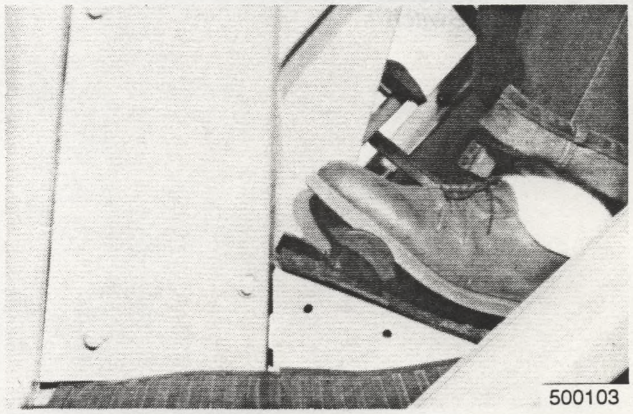


Figure 7: Clutch Pedal

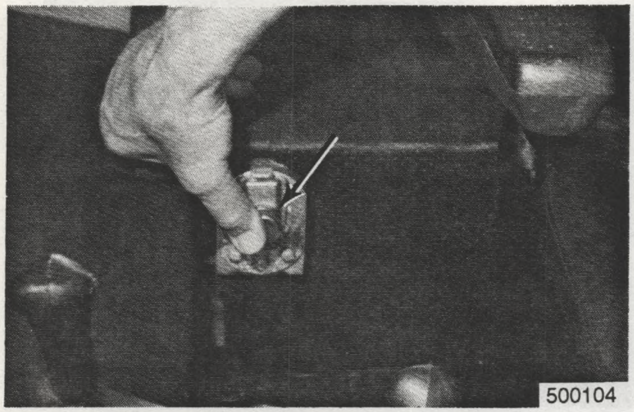


Figure 8: Ground Switch

7. Depress (close) the ground lockout switch.

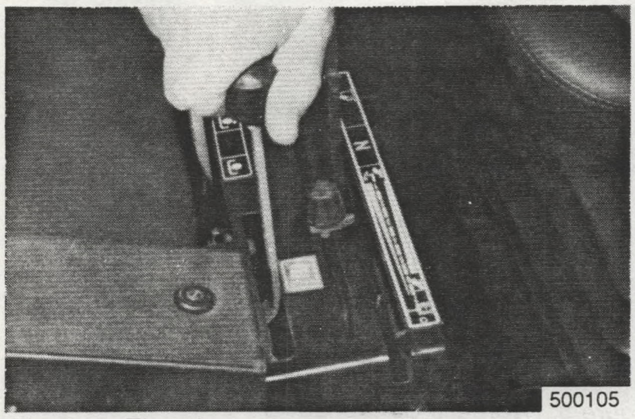


Figure 9: Throttle

8. Move the hand throttle forward to the 2/3 open position.

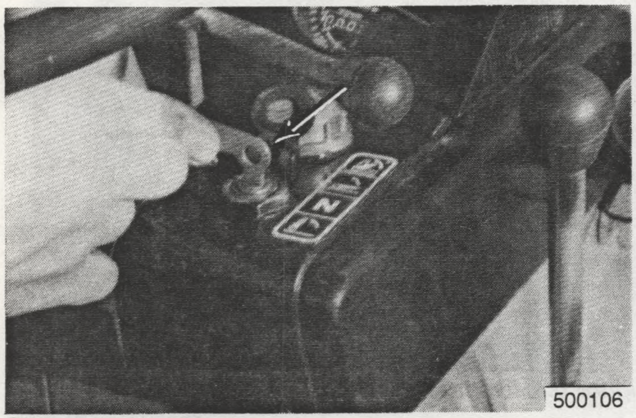


Figure 10: Key Switch

9. Turn and hold the key start switch in the 90° start position to crank the engine until the engine starts, but no more than 15 seconds. Release the key switch.

IMPORTANT: *Do not use the starter motor for more than 15 seconds without interruption. Wait for 1 - 2 minutes between starting attempts to allow the starter to cool.*

10. When the engine is running, check all indicator lights and instruments for normal operation. Slow the engine speed to 1200 - 1300 rpm until the oil pressure stabilizes in the operating range.

Stopping the Engine

IMPORTANT: *Before stopping the engine after operating under load, run the engine at idle speed for a short period of time. This will allow the engine and turbocharger (if equipped) temperature to cool and stabilize gradually.*

Shutdown Sequence:

1. Use the hand throttle control lever to slow the engine speed to idle.
2. Depress the clutch pedal, put the transmission and all control levers in the neutral position.
3. Apply the hand parking brake.
4. Lower the implement to the ground.
5. Move the throttle control lever rearward to the **fully closed** position to shutdown the engine.
6. Release (open) the ground lockout switch.

Cold Temperature Starting (40°F (4°C) and below)

WARNING: Never use ether type starting aids on an engine equipped with glow plugs or electric fuel flame type preheaters. Use of ether to assist starting can result in an explosion and serious bodily injury.

Cold Weather Starting Preparation

IMPORTANT: ***Do not*** *push or tow the tractor to start the engine. Severe drive train damage may result if the tractor is pushed or towed for starting.*

1. To start and operate your tractor during stabilized cold ambient temperatures, change summer grades of oil in the engine, hydraulic system and drivetrain gear boxes to winter grades in accordance with the lubrication specifications.
2. Be sure the batteries are fully charged.

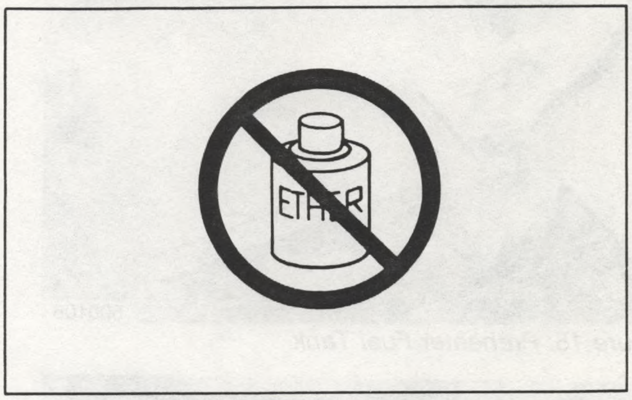


Figure 11:

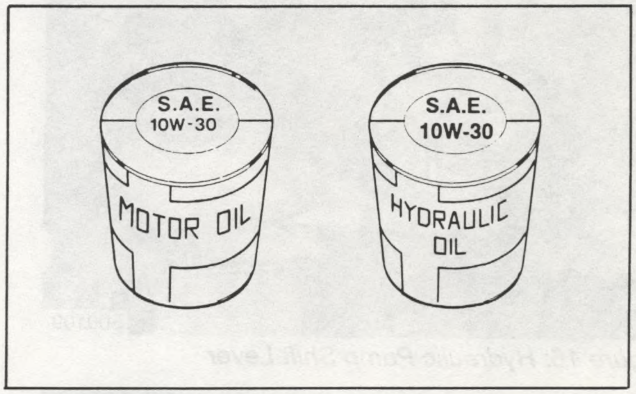


Figure 12:

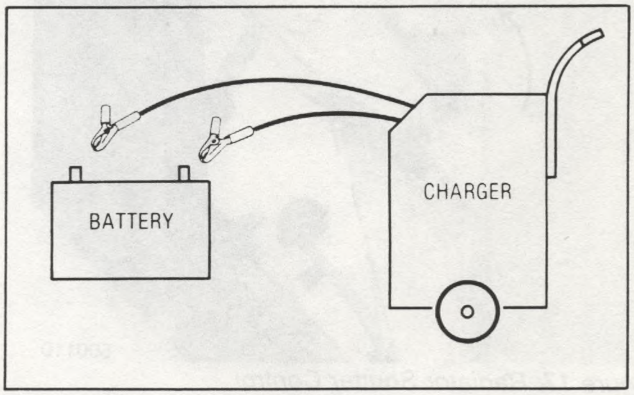


Figure 13:

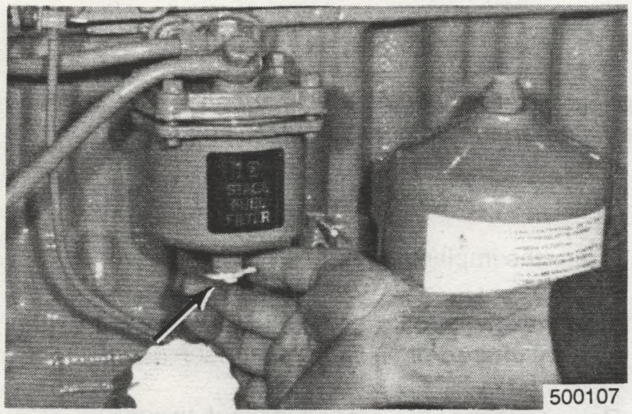


Figure 14: Fuel Filter Drain

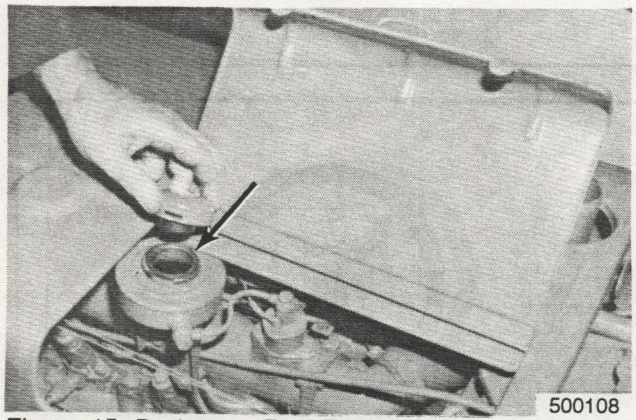


Figure 15: Preheater Fuel Tank

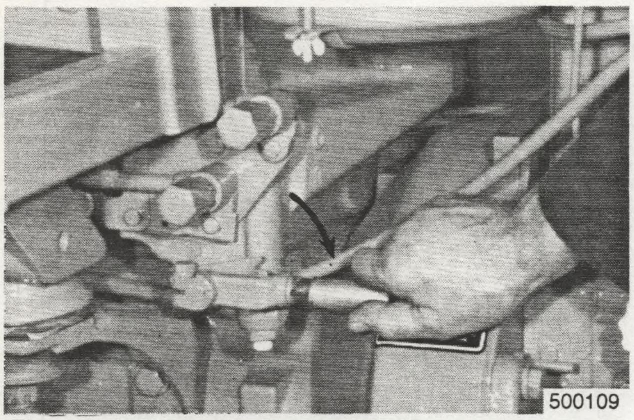


Figure 16: Hydraulic Pump Shift Lever

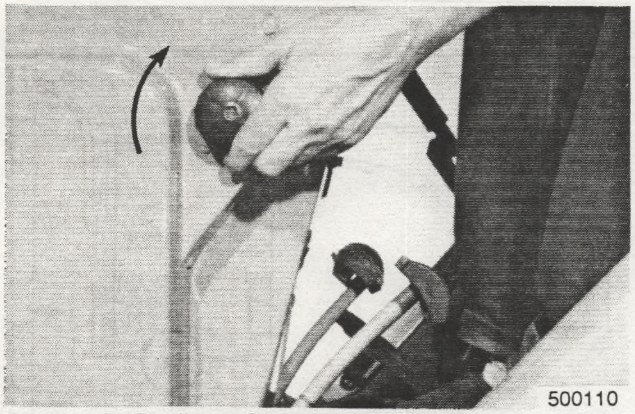


Figure 17: Radiator Shutter Control

3. Use clean, water free diesel fuel of the proper winter blend. Be sure to remove water from the filters and/or fuel tanks each day or damage will occur. See Lubrication and Routine Maintenance section of this manual.

IMPORTANT: *Fill the fuel tanks at the end of each operating day to prevent condensation from forming in the fuel tank.*

4. If your tractor is equipped with an electric fuel flame preheater, fill the preheater fuel tank with No. 1 diesel fuel or kerosene.

Cold Temperature Starting Procedure:

1. To reduce engine drag, disengage the hydraulic pump drive.

2. Raise the radiator shutter curtain. This will allow faster engine warm up on start-up.

3. Depress (close) the ground lockout switch and place all control levers in the neutral position as described earlier.

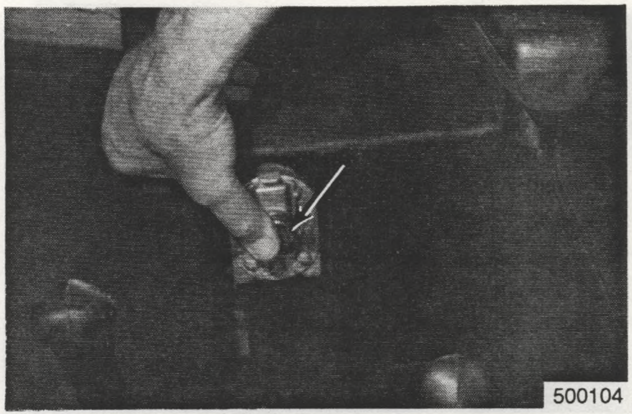


Figure 18: Ground Switch

4. Push the hand throttle to the full open (forward) position.

IMPORTANT: *Be sure the engine emergency stop is pushed in.*

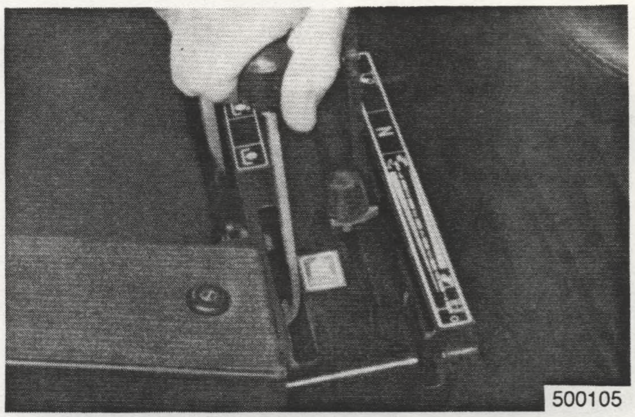


Figure 19: Hand Throttle

5. **On tractor models with a steel style dash panel,** turn and hold the key switch to the 45° preheat position until the preheat indicator lamp glows bright red.

IMPORTANT: *Do not hold in the energize position longer than 30 seconds at a time.*

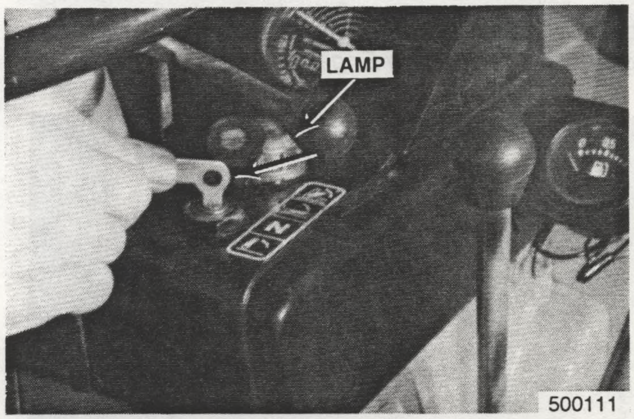


Figure 20: Key Switch Preheat Position

6. **On tractor models with a fiberglass style dash panel,** depress and hold the preheat rocker switch until the preheat indicator lamp glows bright red. **Release the switch.**

IMPORTANT: *Do not hold in the energize position longer than 30 seconds at a time.*

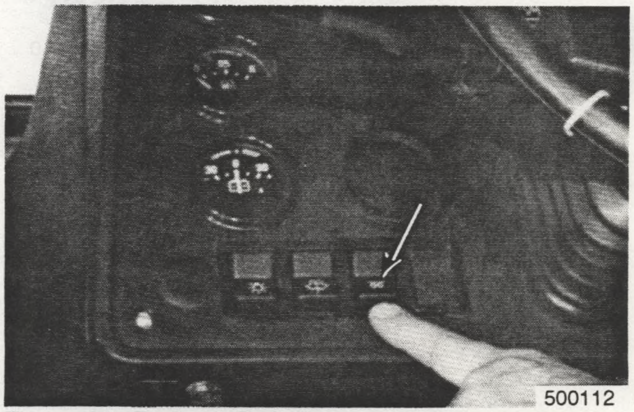


Figure 21: Preheat Switch

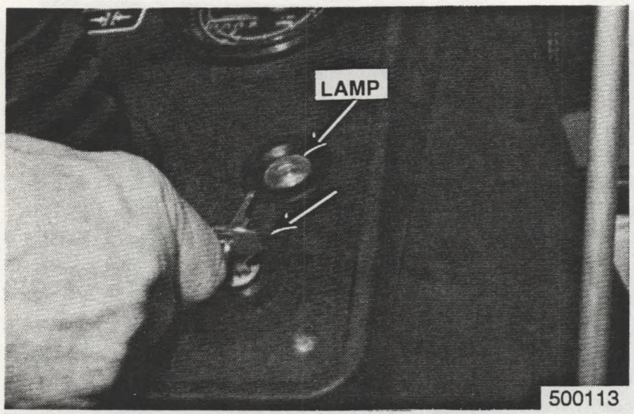


Figure 22: Key Switch 90° Start Position

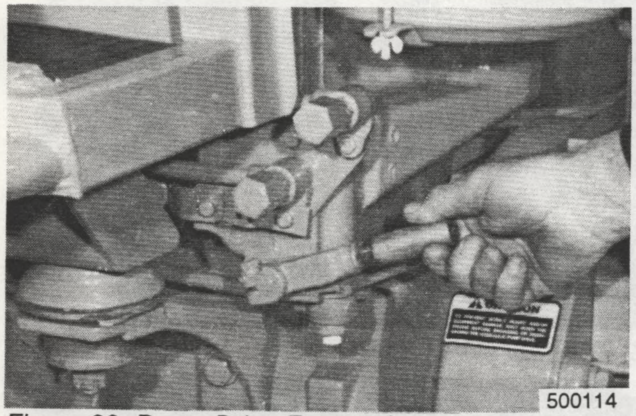


Figure 23: Pump Drive Engaged

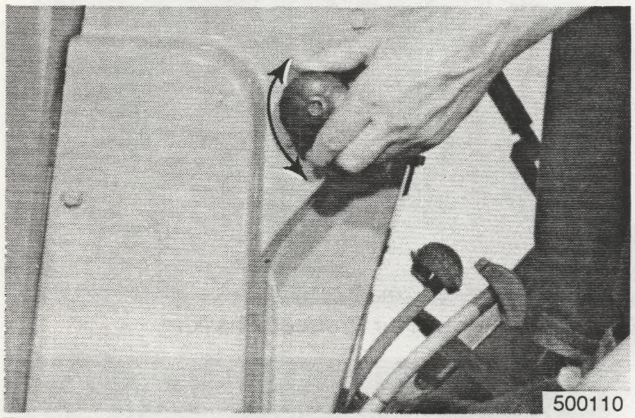


Figure 24: Shutter Control

7. Immediately turn the key switch to the 90° start position to crank the engine. Crank the engine for 15 seconds. If the engine fails to start, wait 30 - 40 seconds and repeat the above procedure.

IMPORTANT: *To prevent severe electrical system damage the preheat switch must be released before cranking the engine on tractors with a fiberglass style dash panel.*

8. When the engine starts and speed increases, reduce the throttle opening to 1200 - 1300 rpm until the engine warms. Check all engine instruments for correct operation.

9. After engine warm up, if hydraulics are required, stop the engine and engage the hydraulic pump drive. Restart the engine.

NOTE: *The pump drive is not synchronized. If the pump shifter will not engage, "bump" the key start switch to turn the engine until the pump shift lever will engage.*

10. Adjust the radiator shutter curtain if necessary to maintain normal engine operating temperature.

Using and Shifting the Transmission

NOTE: *Refer to the ground speed chart in the specifications section of this manual for desired speed range selection.*

Shifting Procedure:

1. Fully depress the clutch pedal and shift the transmission to the "neutral" position.

2. Turn the gear shift knob to the extreme left (CCW) to select either Hi or Lo transmission range.

NOTE: *The gear selector knob can only be turned when the lever is in the neutral position.*

3. Return the lever to neutral, then turn the knob one more notch to the right (CW) to select gears 4/7 or 5/8.

4. Return the lever to neutral, then turn the knob one more notch to the right (CW) to select gears 9 or 3/6.

5. Return the lever to neutral, then turn the knob to the extreme right (clockwise) to the last notch and select gears 1/2 or Reverse 1/2.

IMPORTANT: *All tractor motion must be stopped before shifting or changing gears. If the gear shift will not engage, release the clutch pedal slightly and try again.*

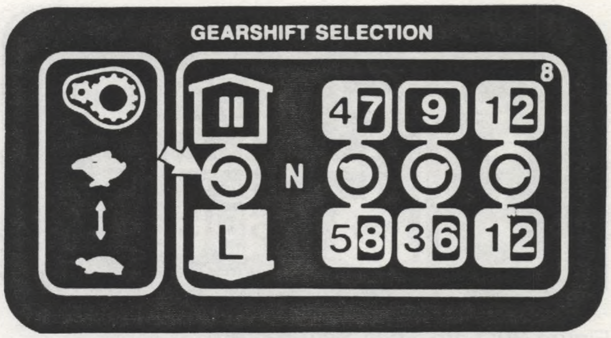


Figure 25: Hi-Lo Range Knob Position

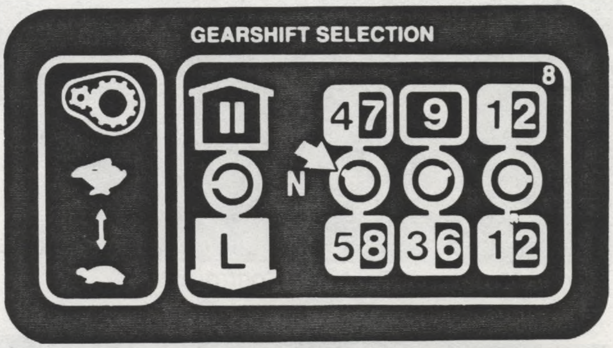


Figure 26: 4/7 or 5/8 Range Knob Position

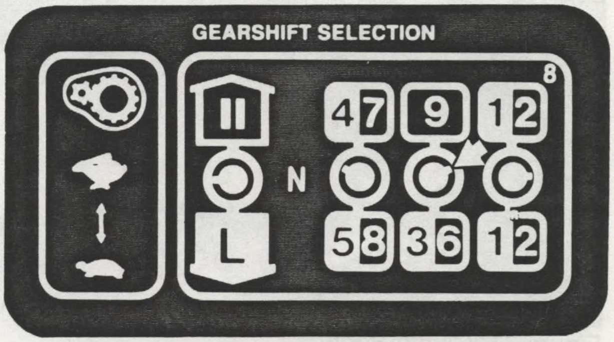


Figure 27: 9 or 3/6 Range Knob Position

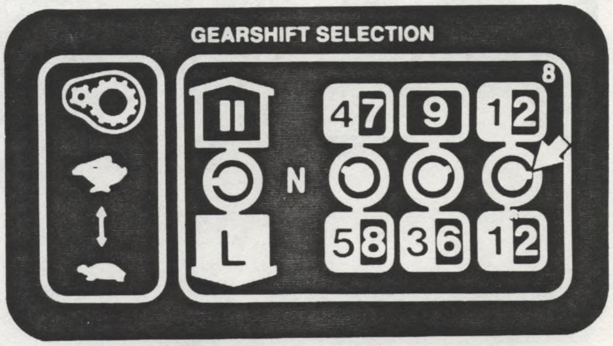


Figure 28: 1/2 or R1/2 Range Knob Position

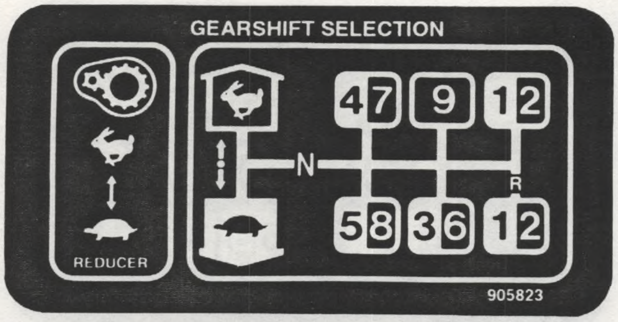


Figure 29: Late Style Shift Pattern

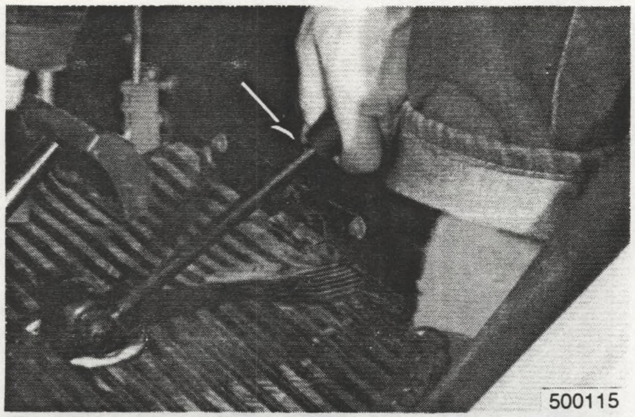


Figure 30: Speed Reducer Control Lever

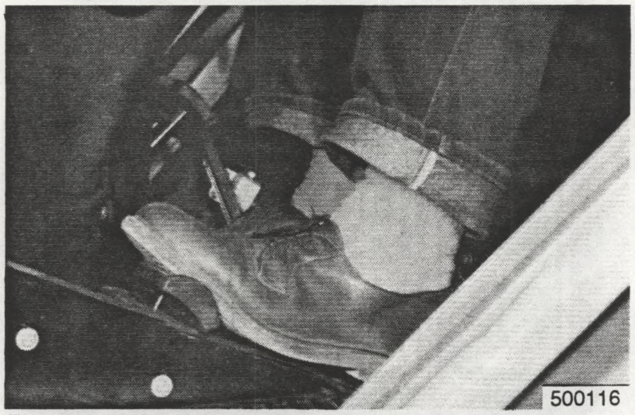


Figure 31: Clutch Pedal

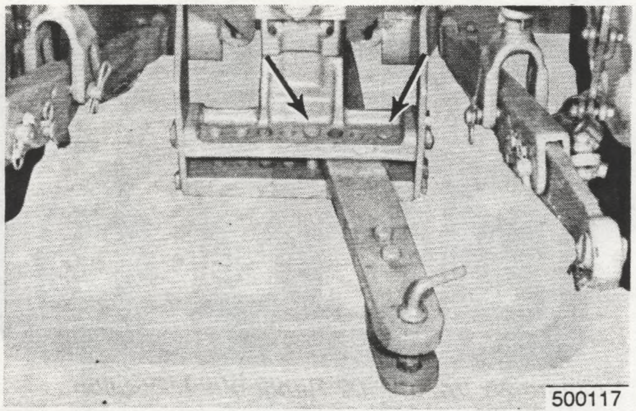


Figure 32: Drawbar Pins

Gear Shift Selection (Late model tractors)

Your tractor may be equipped with a later type shifter design. On this type of shifter, the shifter knob does not require turning to select the gear range. All that is required is to move the lever across the neutral zone to select Hi or Lo range. Then move the lever across the neutral zone to the selected gear slot.

Transmission Speed Reducer (If equipped)

After selecting the main transmission gear range, select either the high or low gear ratio of the speed reducer. Shift the lever forward for high gear ratio or rearward for low gear ratio.

IMPORTANT: *The tractor must be at a complete standstill before changing gear ratios.*

Using the Clutch

Always avoid starting a dead load, such as implements or tillage equipment in the ground. Raise the implements before engaging the clutch.

After transmission gear range and speed reducer ratio selection is made, release the clutch quickly but smoothly to start the load. After the load is started, lower the implement and gradually increase the throttle setting to rated engine rpm.

IMPORTANT: *Do not engage the clutch against a heavy dead load and high engine speed. Slipping the clutch in any way will quickly overheat the clutch and result in early clutch failure.* ***Do not*** *ride the clutch pedal during operation.*

Drawbar

The standard swinging drawbar is adjustable in seven positions from side to side. Use the drawbar for connecting all pull behind equipment.

Always connect the implement hitch to the drawbar with a hardened steel pin of the correct size. Make sure the draw pin is held in place with a lock pin.

IMPORTANT: *When towing equipment on public roads, always connect a safety chain with an adequate load rating between the towed implement and tractor drawbar.*

To avoid PTO driven equipment driveshaft interference, the drawbar clevis can be reversed from the top to bottom side of the drawbar. Remove the clevis attaching bolts to reposition the clevis if necessary. Tighten the attaching bolts to a torque of 180 - 200 lb ft (244 - 270 Nm) whenever repositioning the clevis.

NOTE: *When working with the drawbar, raise the 3-point hitch as far as possible to prevent possible interference between the lower links and towed equipment.*

The drawbar must be locked (pinned) in the center position when doing any of the following operations:

1. When working with PTO
2. When towing loads down hill or on the highway
3. When moving the tractor in reverse with the implement attached

The vertical load on the drawbar is limited to 3000 lb (1400 Kg). Whenever possible, try to balance the vertical load on the drawbar, primarily on the implement wheels. Avoid overloading the drawbar. If necessary, add front weights to improve balance and stability. Always engage the clutch smoothly, avoid jerky starts or stops and use the brakes cautiously when towing heavy loads to avoid jack knifing.

CAUTION: Rear upset can result if pulling from the wrong location on the tractor. Hitch only to the drawbar or other designated pull points. Use the 3-Point Hitch only with properly fastened implements designed for its use.

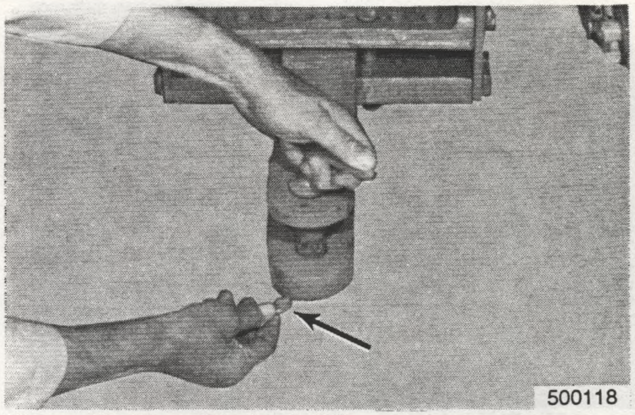


Figure 33: Draw Pin Lock Clip

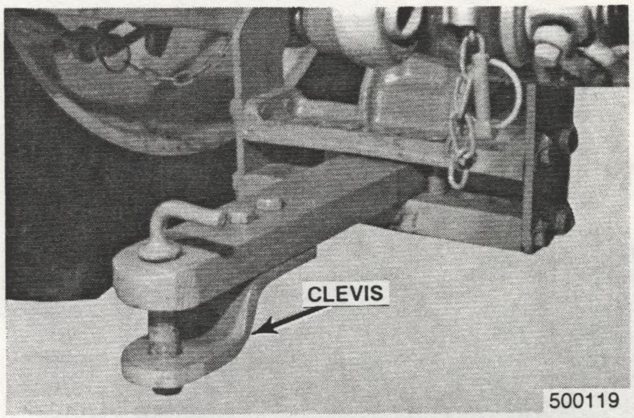


Figure 34: Clevis on Bottom

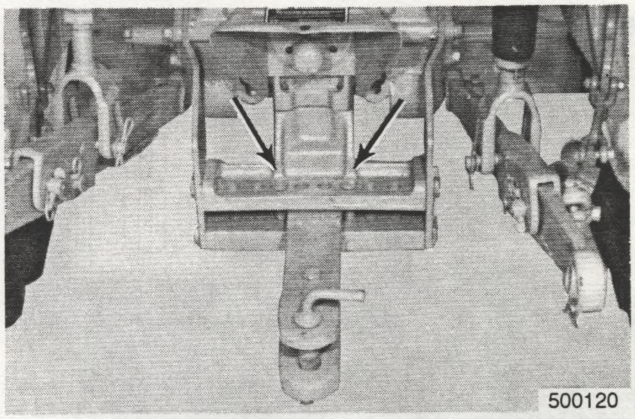


Figure 35:

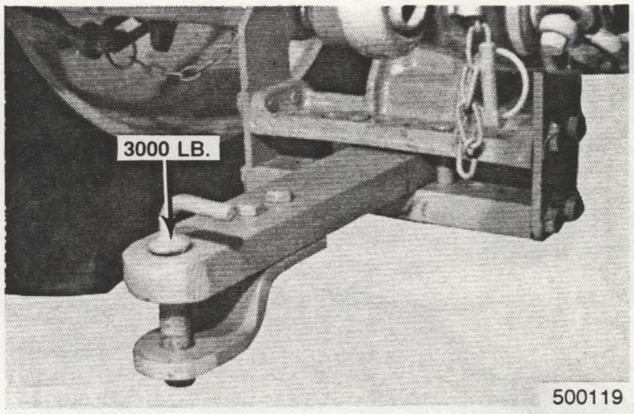


Figure 36: Drawbar Vertical Load

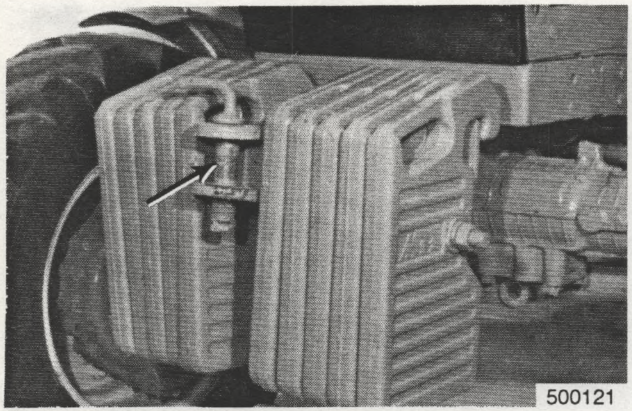


Figure 37: Front Clevis

Front Tow Clevis

The tractor is equipped with a front clevis for use if it becomes necessary to pull the tractor should it become stuck or if the tractor must be towed a short distance. This clevis is not intended for heavy pulling.

IMPORTANT: *If the tractor must be pulled forward for any reason, connect only to the clevis, do not hook to the front axle anywhere or severe damage will result. Towing the tractor to start the engine is not recommended.*

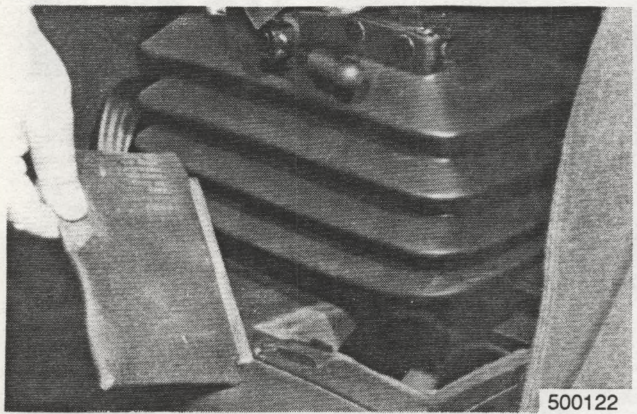


Figure 38: Hand Hole Cover

Power Takeoff

Your tractor is equipped with selectable independent (live) or synchronized (ground) PTO shaft speed capabilities.

To select independent or synchronized PTO shaft speed, remove the hand hole cover located on the floor pan in front of the operators seat.

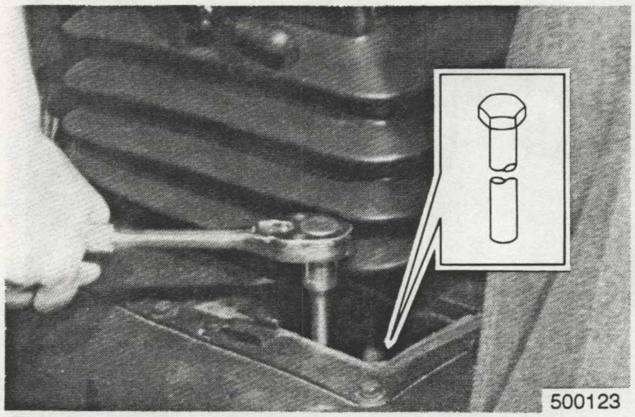


Figure 39: Shift Selector Rod

The shift selector rod for the PTO speed selector is located on the left forward side of the hand hole and has an M22 hex head on the end of the rod. Use a socket wrench to turn the shift rod clockwise until it locks in position for independent PTO drive. Turn the shifter rod counterclockwise until it locks in position to select synchronized PTO shaft speed.

NOTE: *If necessary, depress the clutch pedal or "bump" the starter to engage the shift carrier.*

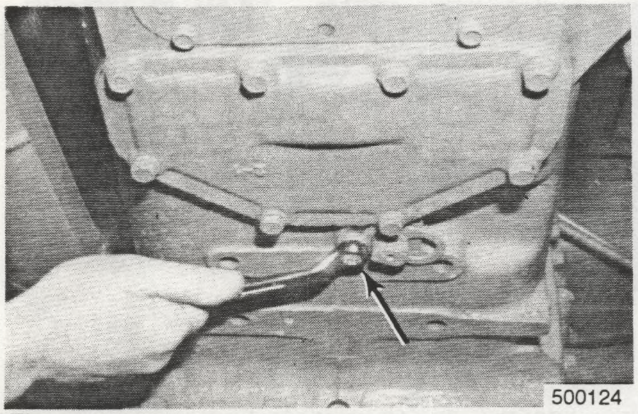


Figure 40: Retainer Bolt

Selectable 540 or 1000 RPM PTO Speed (If equipped)

Tractor models equipped with selectable 540 or 1000 rpm PTO shaft speed system have a shift control located on the bottom side of the transmission.

To change PTO shaft speed, loosen the retainer bolt one full turn.

Use a wrench to turn the shift control shaft counterclockwise to the full engagement position for 540 rpm PTO shaft speed, or turn the shift control shaft full clockwise to engage the 1000 rpm PTO shaft speed. Tighten the retainer bolt.

NOTE: *If the shift selector can not be turned to full engagement, depress the clutch pedal and/or "bump" the starter enough to engage the selector.*

CAUTION: To prevent bodily injury and/or equipment damage, shut down the engine before changing the PTO shaft speed selector.

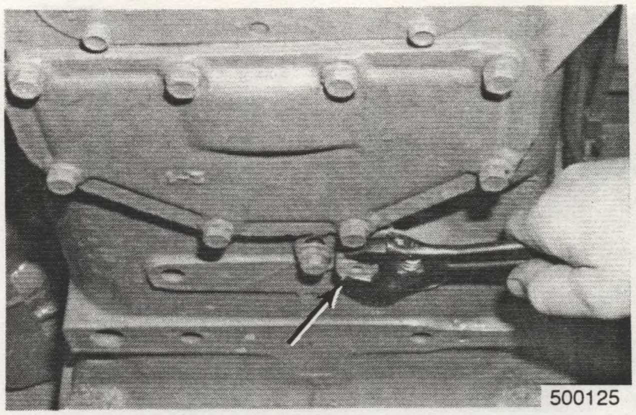


Figure 41: PTO Speed Shift Selector

Rear PTO Tailshaft Change

IMPORTANT: *The rear PTO tailshaft must be changed to match your selected PTO shaft speed. Use a 6-spline, 1.375 inch diameter shaft for 540 rpm PTO speed. Use a 21-spline, 1.375 inch diameter shaft for 1000 rpm PTO that is supplied with the tractor.*

WARNING: To prevent personal injury and/or equipment damage, NEVER connect equipment designed to operate at 540 rpm to 1000 rpm PTO shaft speed.

PTO Tailshaft Change Procedure:

1. Loosen the four PTO shield retaining nuts, remove the shield.

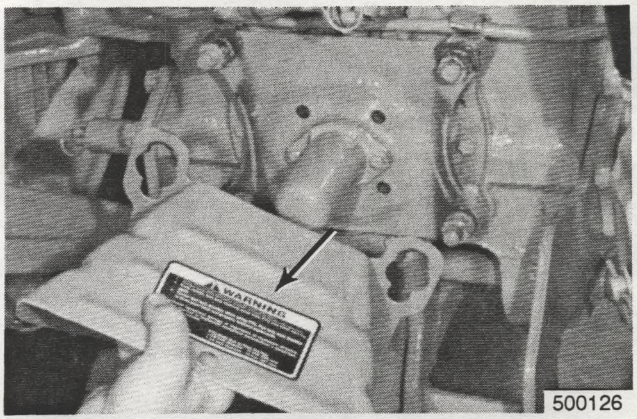


Figure 42: PTO Shield

2. Remove the PTO shaft tubular shield.

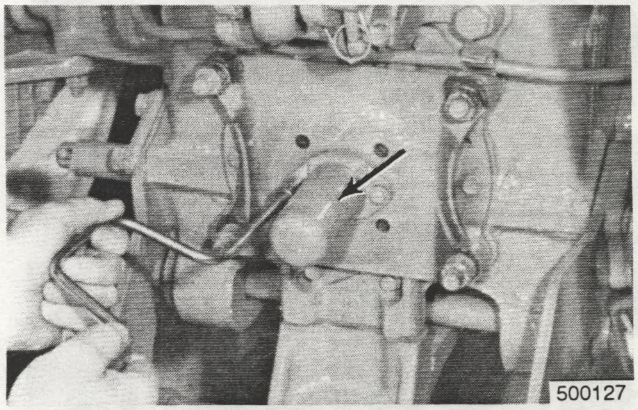


Figure 43: Shaft Shield

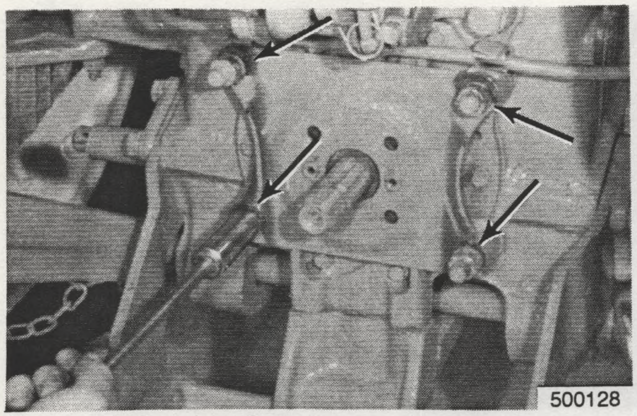


Figure 44: Retainer Bolts

3. Remove the four retainer bolts.

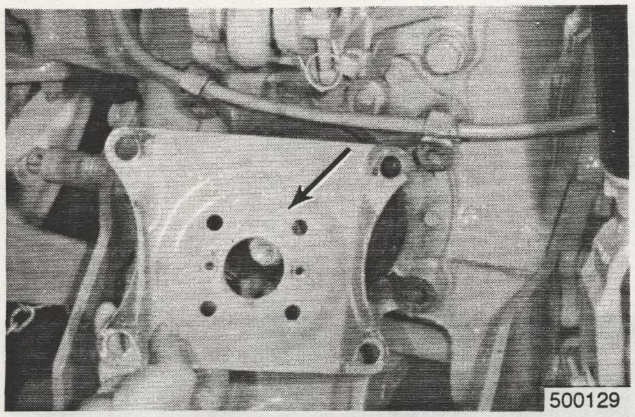


Figure 45: Back Plate

4. Remove the back plate.

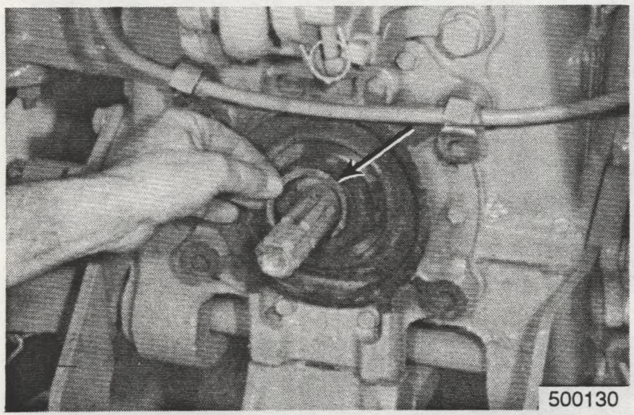


Figure 46: Snap Ring

5. Remove the PTO tailshaft retaining snap ring.

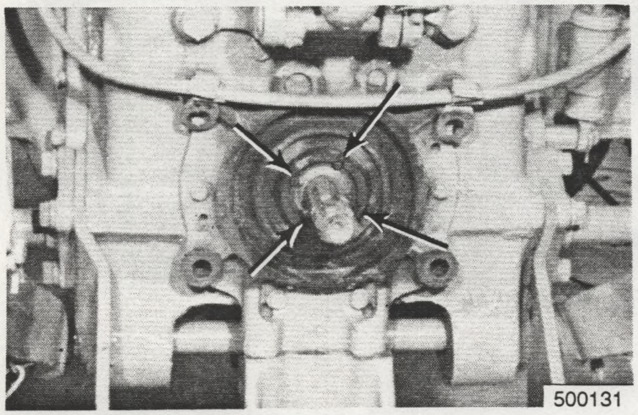


Figure 47: Rollers

6. Pull outwards on the tailshaft to remove the shaft and four rollers.

7. Install the correct tailshaft and rollers for the selected PTO shaft speed.

8. Install the snap ring, back plate, shaft tubular shield and PTO shaft guard in the reverse order of removal.

WARNING: To prevent personal injury whenever PTO guards or shields must be removed for service, be sure they are replaced before operating.

Attaching PTO Driven Equipment

IMPORTANT: *When using three point hitch mounted equipment, follow the implement manufacturers specific recommendations for mounting and connecting hitch mounted equipment.*

1. Remove the rear PTO shaft tubular shield retaining bolts and remove the shield.

IMPORTANT: *Install this shield whenever the PTO is not in use.*

2. When using pull behind PTO equipment, remove and mount the drawbar clevis under the drawbar to prevent interference between the clevis, draw pin and implement PTO shaft.

3. Position and pin the drawbar in the center position.

4. Connect the implement hitch to the drawbar securely before connecting the implement powershaft to the PTO tailshaft.

CAUTION: Shut down the engine and apply the park brake before working in the area of the implement hitch and drawbar.

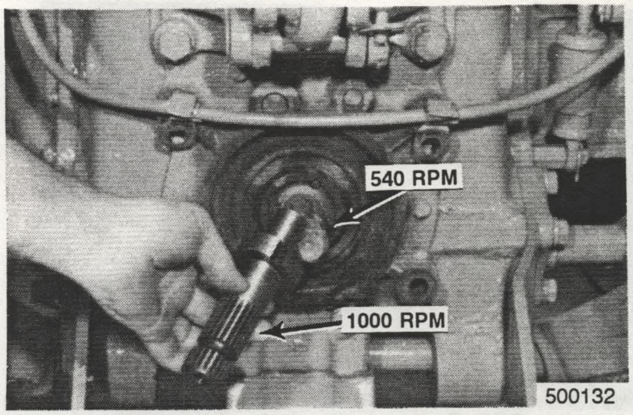


Figure 48: PTO Tailshafts

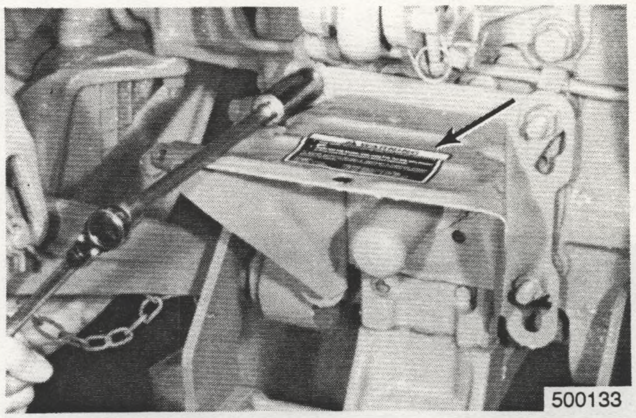


Figure 49: PTO Shield

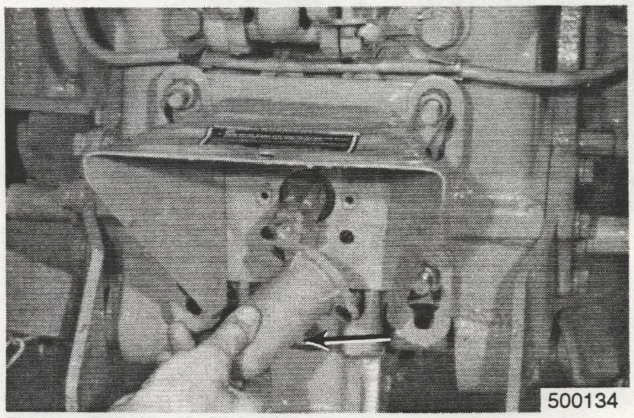


Figure 50: Shaft Shield

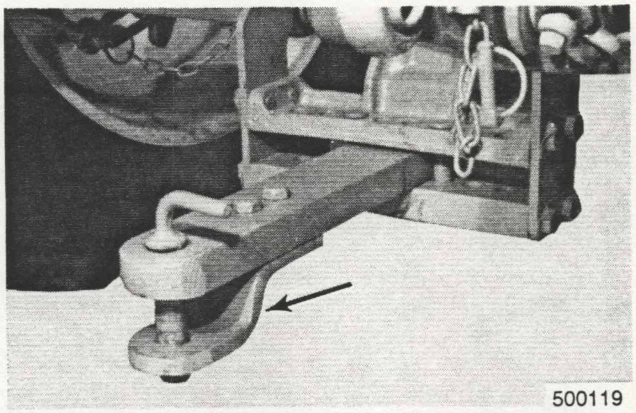


Figure 51: Clevis Position

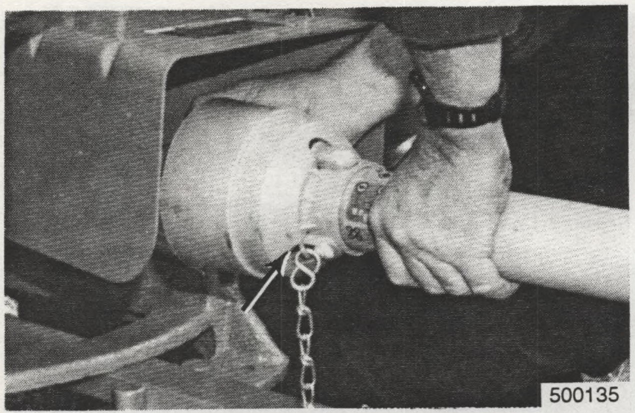


Figure 52: PTO Powershaft

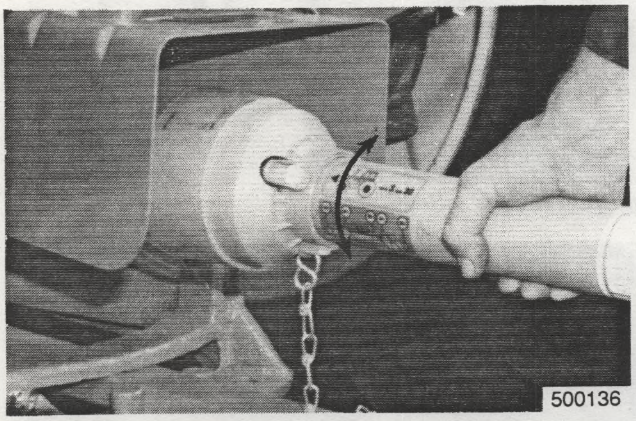


Figure 53:

5. Connect the implement driveline to the tractor PTO shaft. Be sure the powershaft connecting yoke is properly positioned and firmly locked to the tailshaft. Check the powershaft for correct length and for free telescopic movement.

IMPORTANT: *Follow the implement manufacturers recommendations in adjusting and aligning the implement and implement powershaft with the tractor. The correct powershaft length is important to prevent the powershaft from bottoming or separating in any tractor or implement operating position.*

NOTE: *When working with the drawbar, raise the 3-point hitch as high as possible to prevent interference between the lower links and the implement.*

PTO Operation

Before startup make sure all protective shields are in place and in good condition. Be sure the tractor PTO guard is in place and that the implement powershaft integral shield rotates freely without any interference.

WARNING: PTO driven machinery can cause serious injury. Keep all persons away from machinery when in operation. Before working on or near the PTO powershaft, servicing or clearing the driven machine, disengage the PTO, stop the engine, lock the brakes and wait for all motion to stop.

Starting the PTO

CAUTION: Be sure all persons are clear of the tractor and driven implement before starting the PTO.

1. Start the engine and set the throttle to low engine speed.
2. Depress the clutch pedal.
3. Shift the PTO control lever rearward to engage the PTO.
4. Release the clutch pedal smoothly to start the load. Increase engine speed smoothly to the correct rpm for 540 or 1000 rpm PTO operation.

NOTE: *Depressing the clutch pedal will not stop the PTO shaft. Move the PTO control lever forward to disengage and stop PTO shaft rotation.*

CAUTION: When doing stationary PTO work, the park brake must be applied. When dismounting from the tractor with the PTO in operation, keep clear of all moving parts to avoid injury from entanglement.

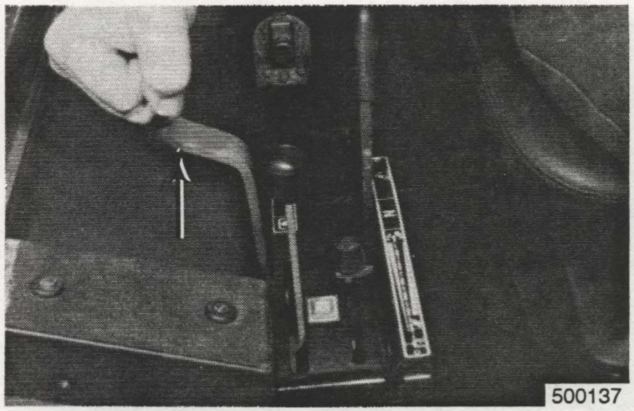


Figure 54: PTO Control Lever

Stopping the PTO

1. Gradually slow the engine speed to low idle.
2. Depress the clutch pedal.
3. Move the PTO control lever forward to disengage the PTO.
4. Shut down the engine, apply the park brake and wait for all motion to stop before dismounting or performing any service.

IMPORTANT: *Whenever possible, idle the engine before disengaging the PTO to place less strain on the equipment and the PTO system.*

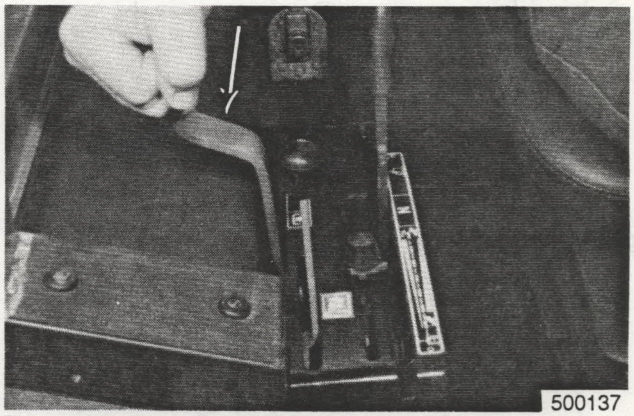


Figure 55: PTO Control Lever

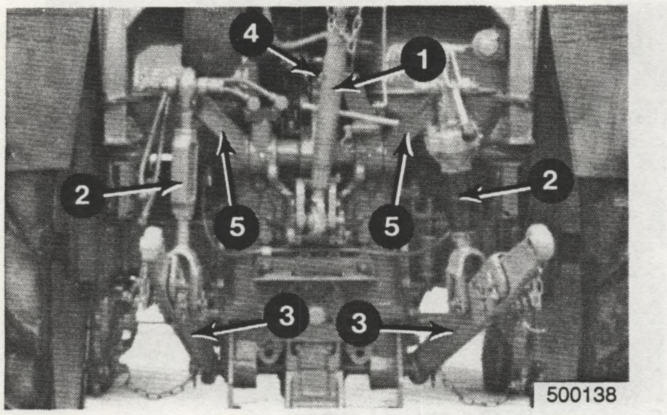
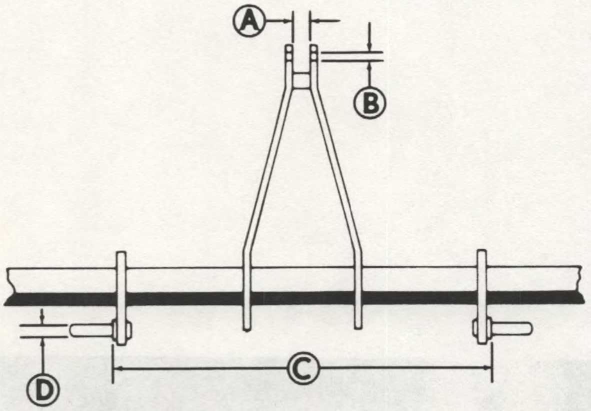


Figure 56:
1 - Center Link
2 - Lift Links
3 - Lower Links
4 - Lift Cylinder
5 - Lift Arms

Three Point Hitch System

Your tractor is equipped with a Category II hitch for the attachment of mounted or semi-mounted equipment on the rear of the tractor. The Category designation means the 3 Point Hitch will accept all mounted implements conforming to the following SAE - ASAE standard dimensions for Category II implements.



(A) 2-1/16" (52.4 mm)
(B) 1.00" (25.4 mm)
(C) 32-7/16" (824 mm)
(D) 1-1/8" (28.6 mm)

Figure 57:

The space at the top of the implement mast (A) is 2-1/16 inch (52.4 mm). The diameter of the holes in the top of the implement mast (B) is 1.00 inch (25.4 mm). the diameter of the implement hitch pins (D) is 1-1/8 inch (28.6 mm) and the space between the hitch pin inner shoulder spread (C) is 32-7/16 inch (824 mm).

Using the Hitch Control Valve

In the standard hitch operating mode, the hitch control valve has four position - Lift, Neutral, Lower and Float. When operating implements equipped with gauge wheels in the standard mode, the float position allows the implement gauge wheels to follow ground contours. Place the valve control lever in the upper position to operate in float.

NOTE: *When working with tillage equipment or plows on hard packed ground, if the weight of the implement is not enough to penetrate the ground, place the control lever in the "lower" position to pressure the implement into the ground. Once penetration is attained, put the control lever in the float or neutral position.*

IMPORTANT: *Forced penetration of the implement must only be attempted when the tractor is moving. Whenever possible the hitch should be operated in the float position.*

NOTE: *Also see "Draft and Position Control Operation" of the hitch in this manual.*

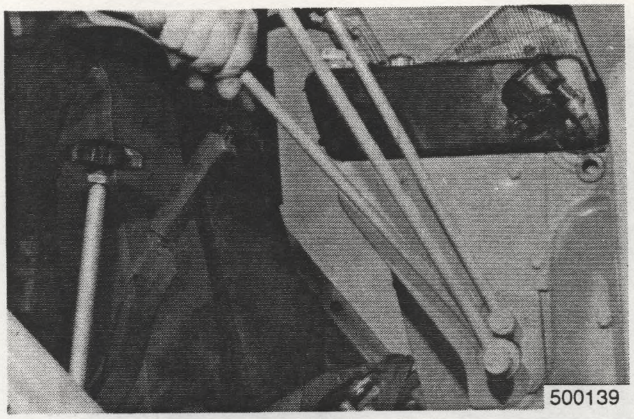


Figure 58:

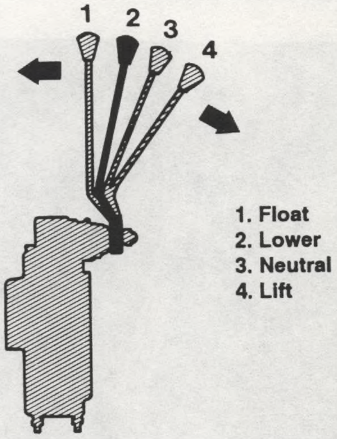


Figure 59:

Draft and Position Control Operation

The draft and position control system can be used to raise, lower and control a wide variety of three point hitch mounted equipment. The system provides two control modes;

Draft Control - to maintain a preset working depth and/or draft load in variable resistance soils and uneven ground surfaces.

Position Control - to maintain an implement in a fixed position relative to the tractor.

IMPORTANT: *When the hitch is used in the draft or position control mode, the hitch control valve lever must be in the neutral position.*

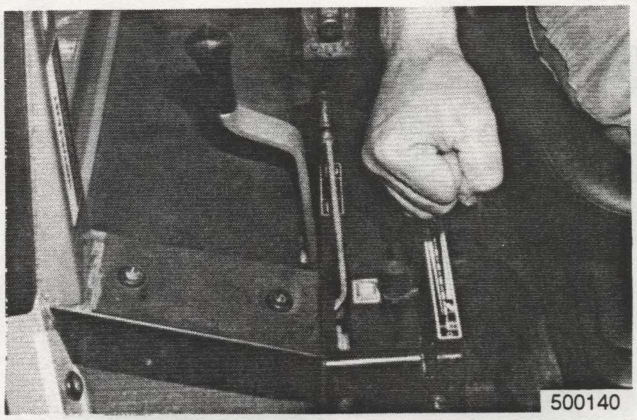


Figure 60: Hitch Lever

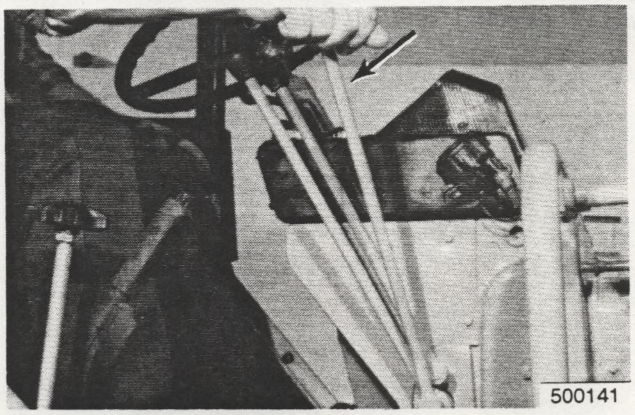


Figure 61: Hitch Control Lever

To Select and Use Draft or Position Control

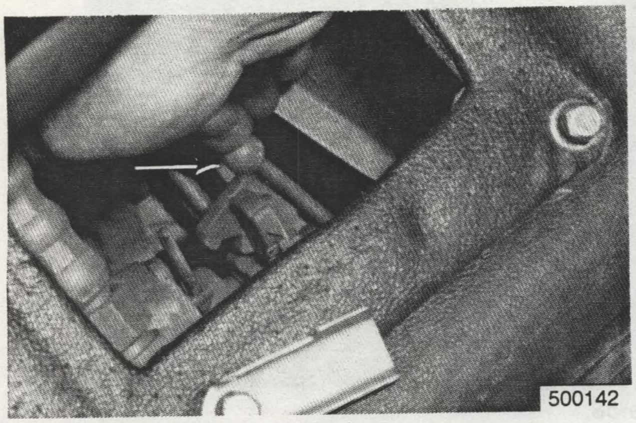


Figure 62: Draft Control Mode

1. Place the hitch hydraulic control valve lever in the "Neutral" position.
2. Place both remote hydraulic control levers in the "Neutral" position.
3. To select the draft control mode of operation, remove the hand hole cover. Move the hitch regulator valve selector control lever knob in an upward direction until the lever cam can be located and engaged in the left hand slot of the actuating cam.

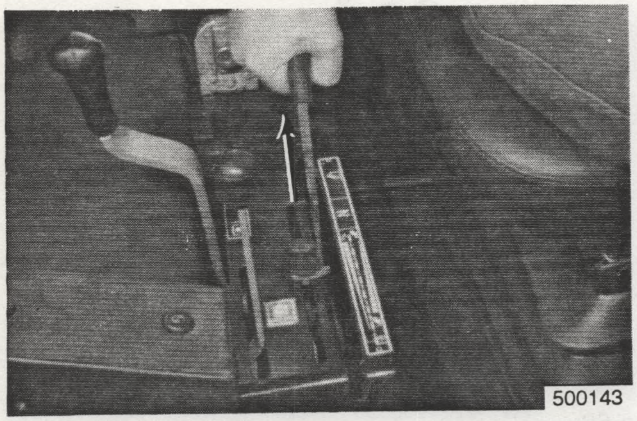


Figure 63: Hitch Raise

4. To select the position control mode of operation, start the engine. Hold the hitch control lever rearward to raise the hitch to the full raised position.

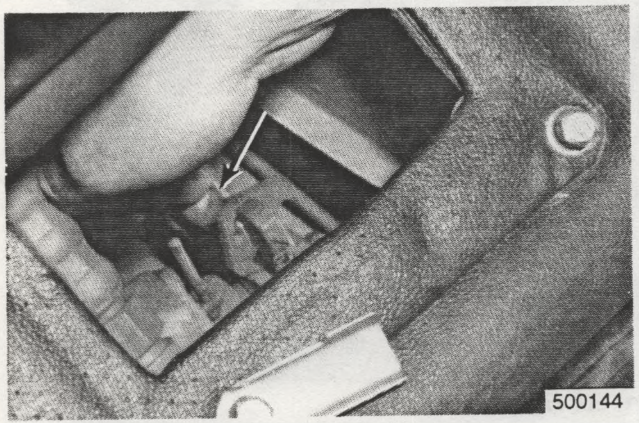


Figure 64: Position Control Mode

5. Move the hitch regulator valve selector control lever knob upwards until the lever cam can be located and engaged in the right hand cam slot.

NOTE: *To disengage the hitch regulator valve to use standard hitch operation., pull outwards on the selector lever knob in the mid-position while the hitch is in the full raised position to disengage both cam slots.*

Rate of Correction (Response)

Initially set the rate of correction (response speed of the regulator valve) control lever in the middle position for draft control operation, or in the upper most (CCW) position for the position control mode of operation.

NOTE: *After the initial setting, response speed can be fine tuned in field conditions. Rotating the lever down (CW) decreases the response speed. If the implement jerks or snatches at the time of correction, reduce the rate of correction speed by moving the lever downward (CW) gradually in small increments.*

When the hitch control lever is moved to the raise position, the rate of implement lift is controlled by hydraulic pump output, **not** the rate of correction (response) control lever.

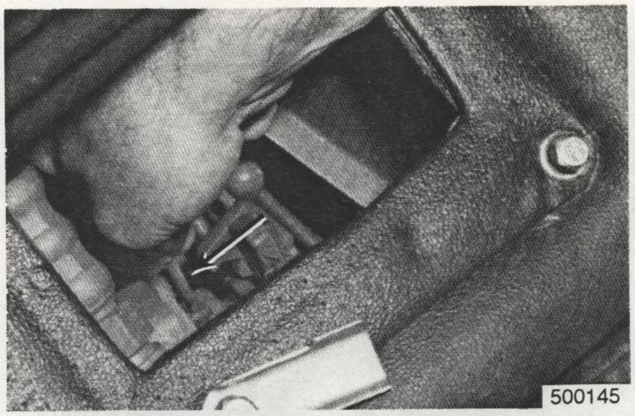


Figure 65: Correction Response Lever

Hitch Draft/Position Control Lever

Use the draft and position control lever located on the right side console to control hitch operation and position. Move the lever forward from neutral to lower the implement to the desired tillage depth or position. The farther the lever is pushed forward the deeper the depth.

After tillage depth or implement position is determined, loosen the lever stop knob, move the lever stop in the slot to contact the control lever and tighten the knob. This will limit lever travel for repeatable and consistent hitch operation.

To raise the implement, move and hold the lever rearward to the limit of travel. When the implement is raised, release the lever and it will return to the neutral position.

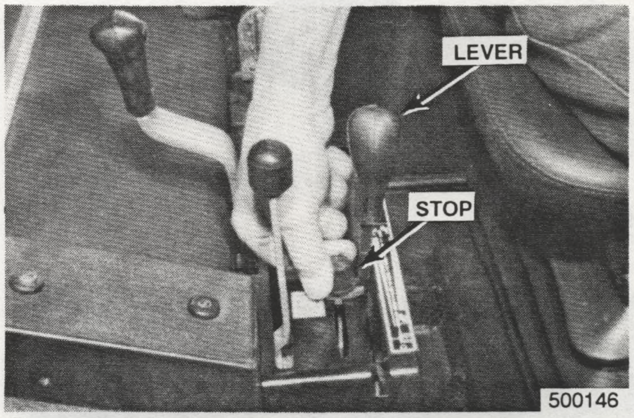


Figure 66: Hitch Control

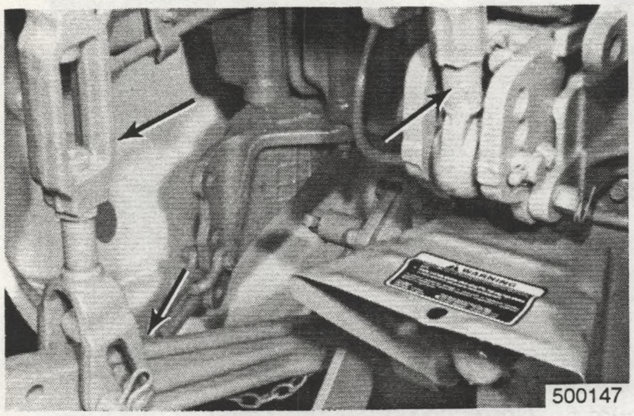


Figure 67: Hitch Links

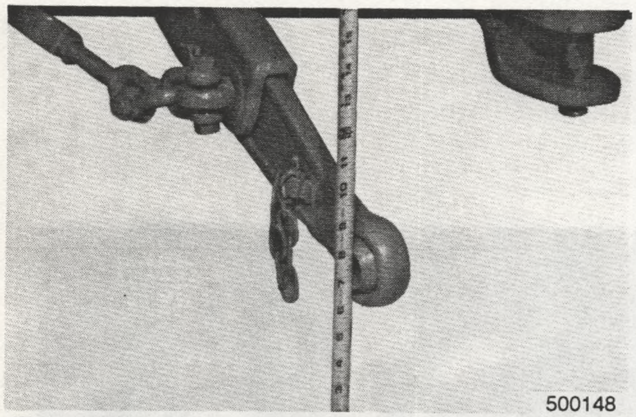


Figure 68:

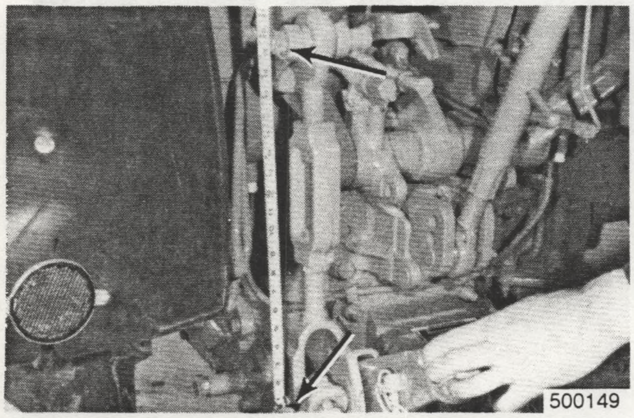


Figure 69: Left Side Lift Link

Hitch Linkage Adjustments

The upper and lower hitch links must be adjusted so that the implement can work the way it was intended to work and to simplify hooking up to the implement.

Make sure tire pressures, wheel equipment and ballasting are correct before making hitch adjustments. Study the implement Operators Manual for recommended hitch adjustments and operation.

To prepare the tractor for operation with mounted or semi-mounted three point hitch equipment, proceed as follows:

⚠ **CAUTION: To prevent bodily injury, do not stand between tractor and implement unless the implement is lowered to the ground, engine shut down and the hand park brake is applied.**

Procedure:

1. Park the tractor on a hard level surface and lower the hitch to its lowest position. Measure the distance from the center line of the lower link pin holes to the ground. This distance should be a minimum of 8 inches (203 mm), regardless of tire size or tractor ground clearance to attach most Category II implements.

2. The left side lift link is factory adjusted to 20 inches (515 mm) between the center of the lift link upper and lower attaching pins. This dimension normally is satisfactory in most applications for attaching implements and tillage operations.

3. If it should become necessary to adjust the left side lift link, loosen the turn buckle jam nut. turn the turnbuckle clockwise to shorten, or counterclockwise to lengthen the link as required. After correct adjustment tighten the turnbuckle jam nut.

4. The right side lift link is adjusted mechanically by turning the adjusting crank clockwise or counterclockwise as required to shorten or lengthen the lift link for implement attachment or field operations.

NOTE: *Final adjustment to level the implement from side to side in the field is done on the right side lift link.*

Lower Draft Link Mechanical Flotation

One or both lower links can be adjusted to allow up or down free float. Free float is commonly used when operating in variable field conditions and/or when using implements that are equipped with gauge (supporting) wheels to allow the implement to follow surface contours and place less strain on the hitch system.

Mechanical free float is also used when the implement width is more than the wheel base of the tractor. Whenever possible the lower draft links should be allowed to operate in the free float position. Consult your implement manufacturers operating manual to see if mechanical free float can be used.

To adjust the lower links for mechanical float: Remove the lower lift link pin. Reposition the lift link on the lower link to the slotted hole and install the pin. This will allow approximately 2 inches (50.8 mm) free float on each lift link.

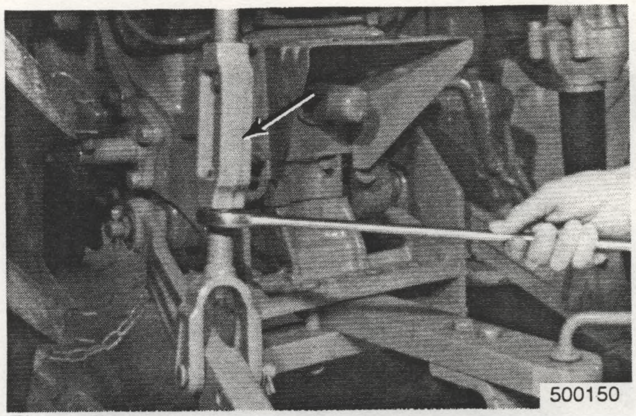


Figure 70: Left Lift Link

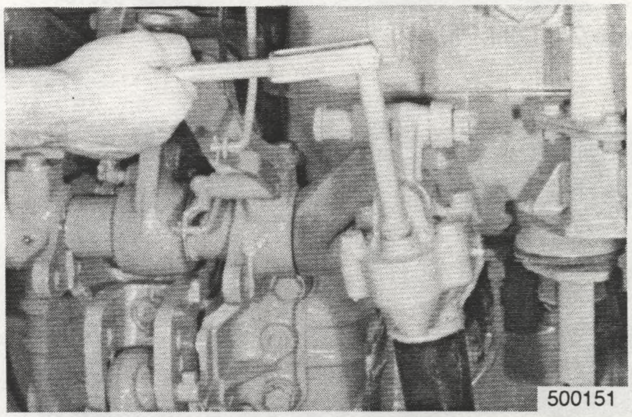


Figure 71: Right Lift Link

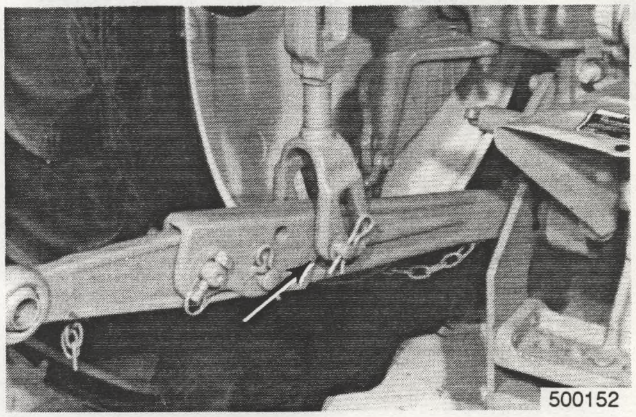


Figure 72: Rigid Position

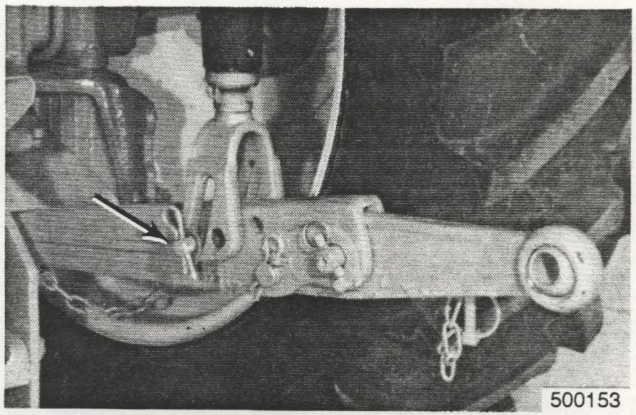


Figure 73: Float Position

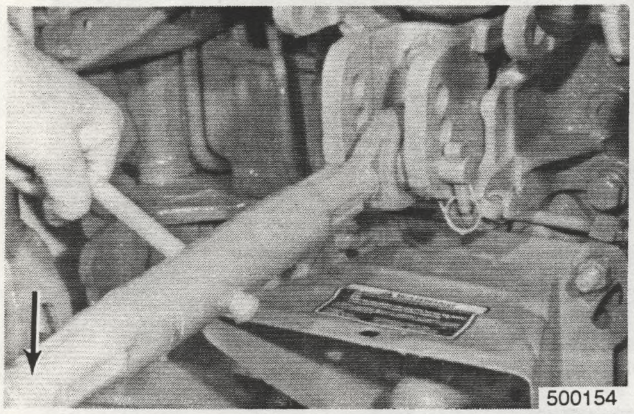


Figure 74: Lock Nut

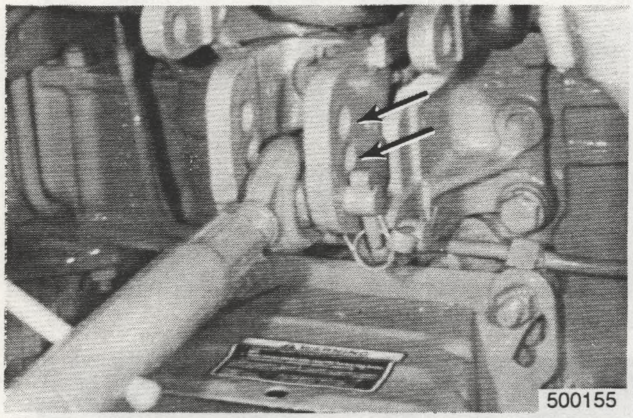


Figure 75: Center Link Mount

Center Link Adjustment

The upper (center) link is the center hitch point of the three point hitch. The upper link must be adjusted for proper weight transfer and to level the implement from front to rear in its operating position.

To adjust the length of the center link, loosen the turnbuckle locknut, use the handle to turn the turnbuckle clockwise to lengthen the link or counterclockwise to shorten the link.

The center link can be installed in any one of the three positions of the front mounting bracket, depending on the type of soil conditions or mode of operation (ie draft or position control) and/or implement used. In general, locating the center link in the lower holes of the bracket provides for more weight transfer and deeper tillage. The top hole is used in case of light soil or when shallow tillage is required.

CAUTION: If the center link is installed in the lower holes for maximum weight transfer, steering control may be reduced. Additional front ballast must be used to ensure the front steering wheels maintain ground contact for steering control.

IMPORTANT: *The total tractor weight with all equipment and ballast must never be more than the published maximum recommended operating weight of 12,000 lb (5436 Kg).*

In normal hitch operations and/or draft control mode, the center link is mounted in the second hole from the top. This ensures satisfactory sensitivity of the sensor in a wide range of tillage depth or implement draft.

In the "position" control mode of operation, the center link can be mounted in any of the three bracket holes.

NOTE: *Refer to your implement operators manual for the correct adjustment of the center link.*

Hitch Sway Check Rods

Adjustable rods are used on the outer sides of each lower draft link to control lateral (sway) movement of the hitch in both the working and transport position of the hitch.

Some implements such as plows require some lateral movement in the working position and should be rigid in the transport position. Consult your implement operators manual to see if sway is required.

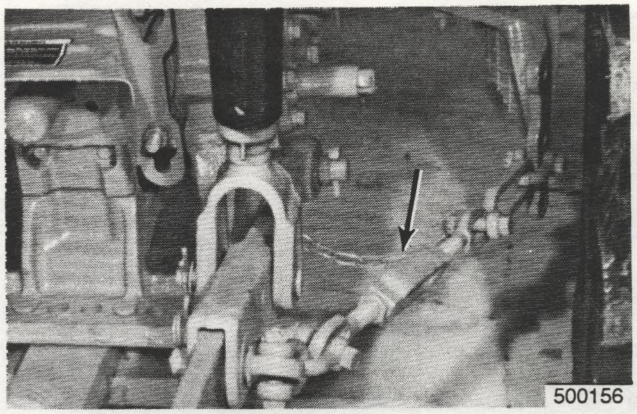


Figure 76: Sway Check Rod

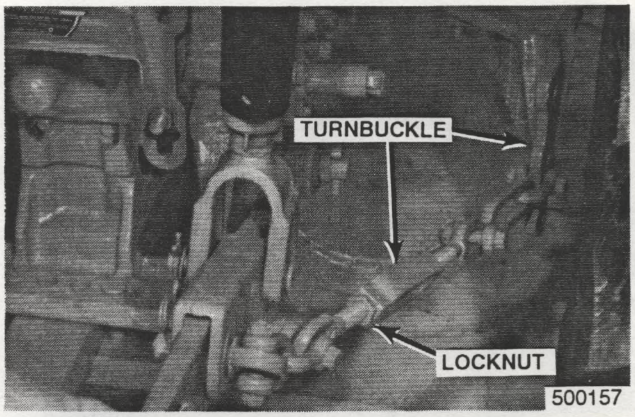


Figure 77:

Sway Adjustment Procedure:

1. Lower the hitch, loosen the adjustment turnbuckle locknut. Rotate the turnbuckle to lengthen each sway check rod equally until there is ample slack.

NOTE: *The implement must be attached to the hitch.*

2. Slowly raise the hitch to the full raised transport position.

CAUTION: To avoid bodily injury and/or machine damage when 3-Point Hitch implements are attached to the tractor, check the full range of operation for interference or binding. Shut down the engine and apply the hand operated park brake before making any adjustments.

3. Adjust each sway rod turnbuckle equally from side to side until all sway is removed from the hitch in the transport position.

NOTE: *When adjusted correctly, the implement should not sway more than 0.75 inch (20 mm) to either side.*

4. Lower the hitch and check for interference and operation in the working position. After correct adjustment of the sway rods, tighten the turnbuckle locknut.

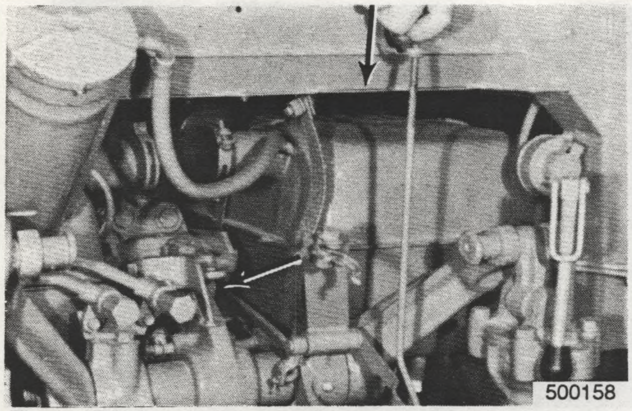


Figure 78: Latch Engaged

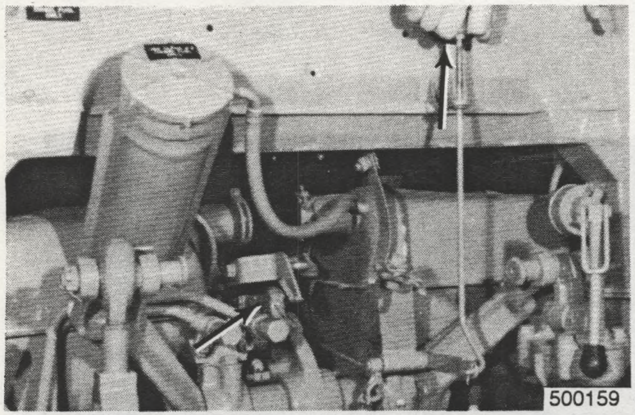


Figure 79: Latch Released

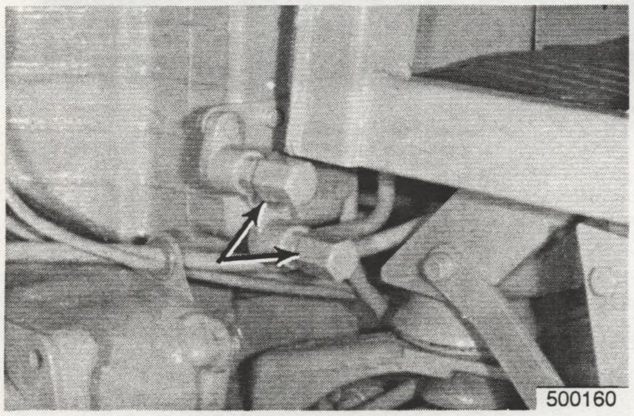


Figure 80: Left Side Remote Connector

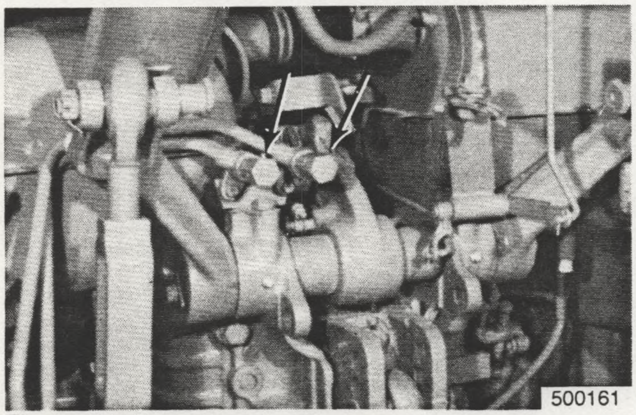


Figure 81: Rear Remote Connector

Hitch Transport Lock Operation

To prevent the hitch and implement from settling when transporting, raise the hitch to the full up position. Push downward on the hitch latch control rod to engage the latch over the hook on the rockshaft.

To release the transport latch, raise the hitch and pull upwards on the latch control rod to disengage the latch from the hook on the rockshaft.

Remote Hydraulic Cylinders

To operate hydraulically actuated implements, double or single acting remote cylinders may be used. Remote cylinder kits, including adaptors, may be ordered from your Belarus dealer.

IMPORTANT: *When using single acting cylinders, use the "float" position of the control valve to lower implements.* ***Do not*** *use the "lower" position.*

To allow the use of remote hydraulic cylinders, the tractor is equipped with three conveniently located hydraulic connection points. One connection point is located on the left side behind the rear of the engine.

One connection point is located at the rear center of the tractor.

NOTE: *The left side and rear outlets are controlled by the left remote control valve actuating lever.*

One connection point is located on the right hand side behind the rear of the engine. This outlet is controlled by the right side actuating lever.

NOTE: *The control levers are detented in the "neutral" and "float" position of the valve.*

Front Wheel Tread Width Setting (2WD Model Tractors)

The factory set front wheel center to center tread width setting is considered optimal and recommended for most tillage operations. If required, front wheel center to center tread width can be adjusted for various row crop or front loader applications by repositioning the axle extension tubes and/or changing the position of the wheel disc offset "in" or "out" on the wheel hub.

Front wheel tread width setting is adjustable in 4 inch (100 mm) increments on the tube from 51 inches (1300 mm) to 70 inches (1800 mm), center to center front wheel tread setting.

IMPORTANT: *Front wheel center to center tread width setting must not exceed 70.0 inches (1800 mm).*

NOTE: *To obtain 57 inch (1450 mm) tread width, adjust the right side axle extension tube only.*

Adjusting Front Axle Tread Width Procedure (2WD Model Tractors):

1. Put blocks in front of and behind the rear wheels. Apply the park brake.
2. Put a jack under one side of the front axle sleeve. Raise the wheel clear of the ground.
3. Remove the tube locating pin cotter key and remove the pin.

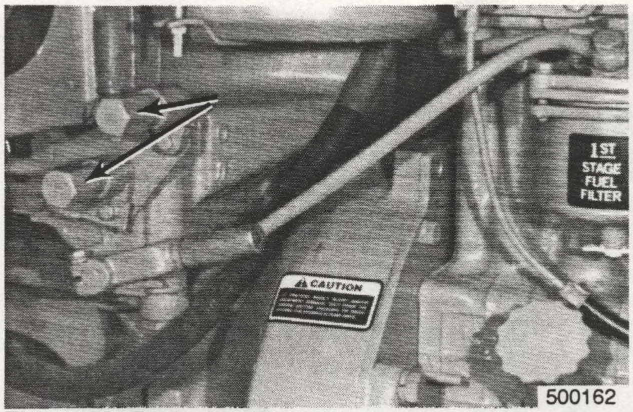


Figure 82: Right Side Remote Connector

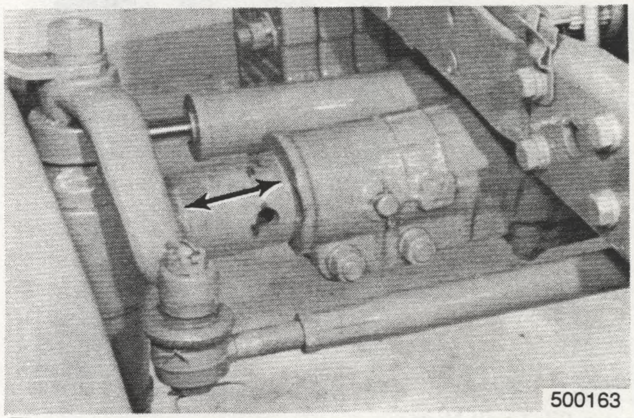
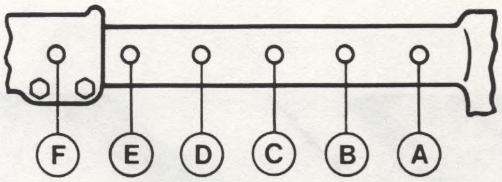


Figure 83: Front Axle Adjusting Tube



A - 51 in. (1300 mm)
B - 55 in. (1400 mm)
C - 59 in. (1500 mm)
D - 62 in. (1600 mm)
E - 66 in. (1700 mm)
F - 70 in. (1800 mm)

Figure 84:

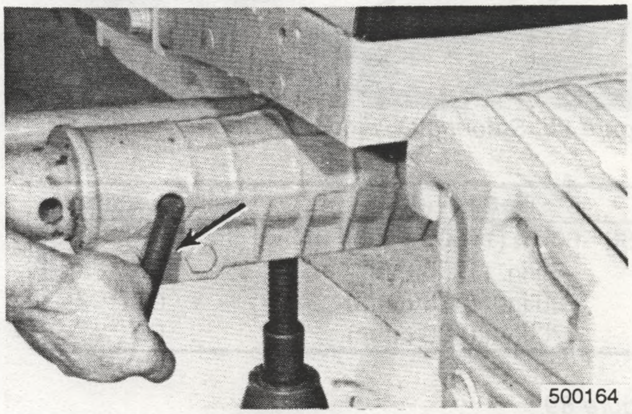


Figure 85: Locating Pin

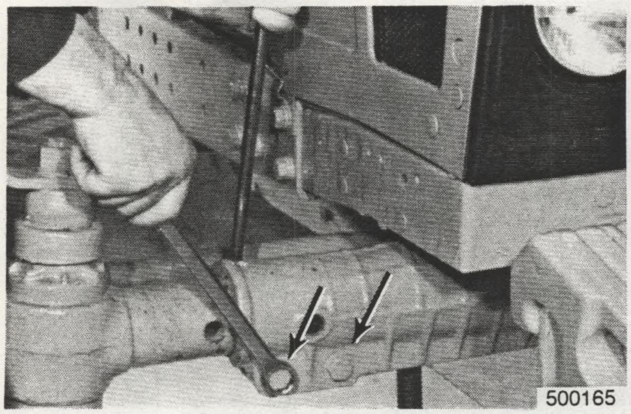


Figure 86: Clamp Bolts

4. Loosen the two axle sleeve clamp bolts.

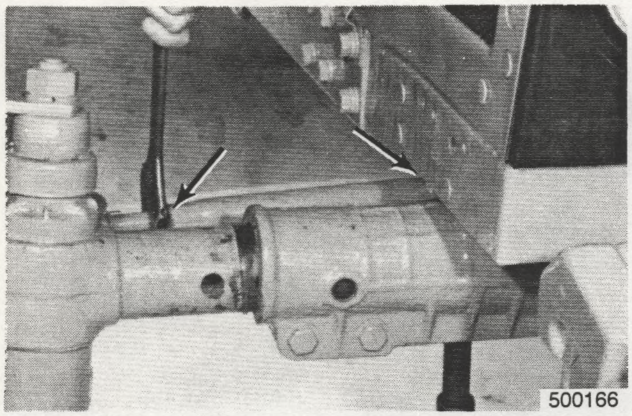


Figure 87: Lock Nuts

5. Move the axle tube out of the sleeve a small amount. Loosen the lock nuts on each end of the tie rod adjusting sleeve. Turn the sleeve to lengthen the tie rod as the axle tube is moved outwards to the desired tread width setting.

NOTE: *Mark the tie-rod adjusting tube and count the number of turns made during adjusting so that the opposite side tie-rod can be adjusted equally.*

6. Install the axle tube locating pin and tighten the two sleeve clamp bolts. Repeat the procedure for the opposite side.

NOTE: *Do not tighten the tie-rod adjusting tube lock nuts until after checking and/or adjusting front axle toe-in. See "Adjusting Front Wheel Toe-In".*

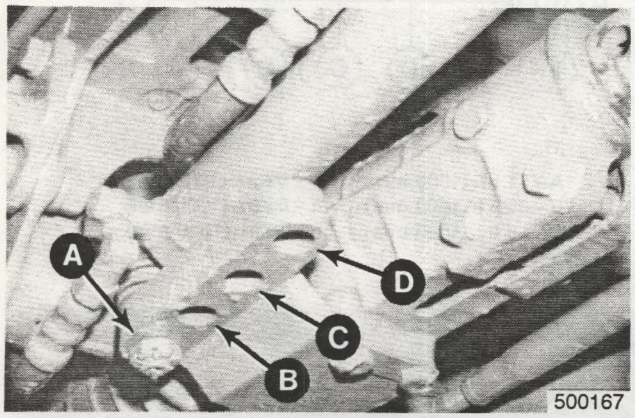


Figure 88: Steering Cylinder Mount

7. The power steering cylinder must be repositioned in the anchor bracket holes for the various tread width settings. Remove the cotter pin and pivot bolt nut. Change hole positions to correspond to the following tread widths.

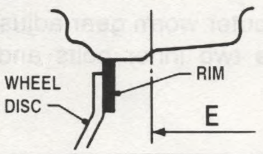
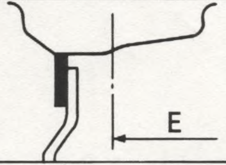
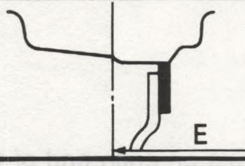
Tread Width	Hole Position
56 - 60 in. (1450 - 1550 mm)	A
63 in. (1650 mm)	B
68 in. (1750 mm)	C
70 in. (1800 mm)	D

Figure 89:

Front Wheel Tread Width Setting (MFD Model Tractors)

Front wheel tread width for MFD model tractors can be adjusted in various increments from 56 inch (1422 mm) to 73 inch (1854 mm) by repositioning the axle tube extension and/or repositioning the wheel disc relative to the rim as shown in the chart.

FRONT WHEEL TREAD WIDTH SETTING,
WHEEL/RIM AND STEERING CYLINDER POSITIONS
MFD MODEL TRACTORS

RIM/WHEEL DISC POSITION	TREAD WIDTH (Center to Center)		CYLINDER HOLE POSITION	TUBE/SLEEVE DISTANCE "D"	
	Inch	(mm)		Inch	(mm)
	56"	(1422)	A	1.5"	(39)
	60"	(1524)	B	3.4"	(85)
	63"	(1600)	C	5.3"	(135)
	58"	(1473)	A	1.5"	(39)
	61"	(1549)	B	3.4"	(85)
	65"	(1651)	C	5.3"	(135)
	66"	(1676)	A	1.5"	(39)
	69"	(1753)	B	3.4"	(85)
	73"	(1854)	C	5.3"	(135)

E = Rim Center Line

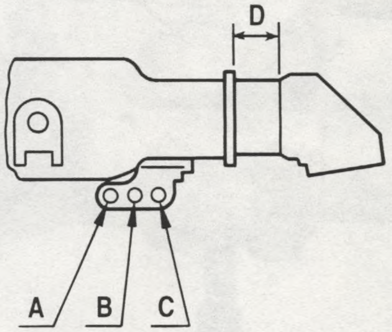


Figure 90:

When adjusting tread width, it may be necessary to reposition the hydraulic steering cylinder into different holes in the anchor bracket. Reference the above chart to determine the correct mounting hole to use.

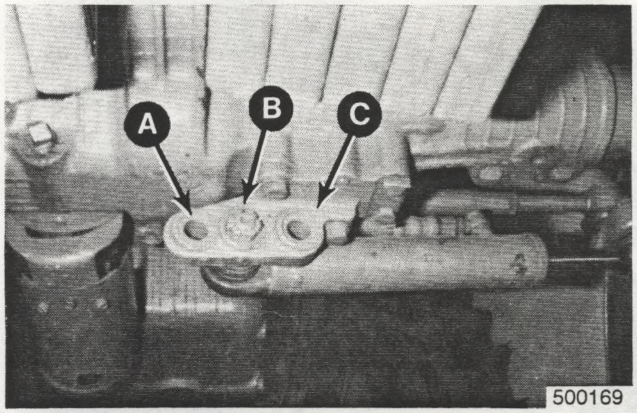


Figure 91: Steering Cylinder Mount

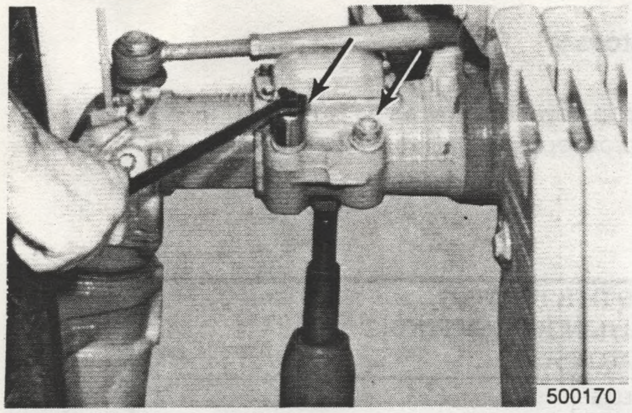


Figure 92: Clamp Bolts

Adjusting Tread Width Procedure (MFD Model Tractors):

1. Apply the park brake, put blocks in front of and behind the rear wheels.

2. Put a jack under one side of the front axle sleeve. Raise the wheel clear of the ground.

3. Loosen the axle sleeve clamp bolts.

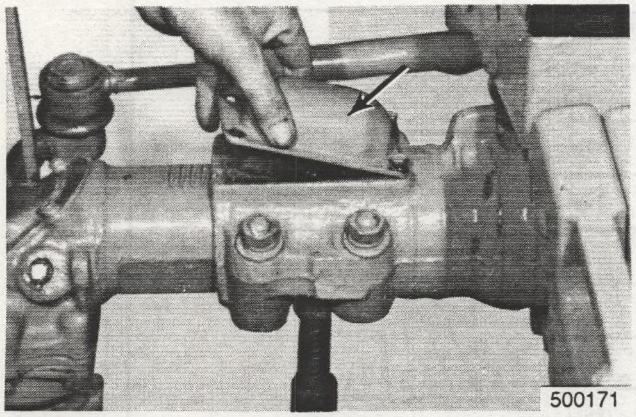


Figure 93: Adjuster Cover

4. Remove the two outer worm gear adjuster cover bolts. Loosen the two inner bolts and remove the cover.

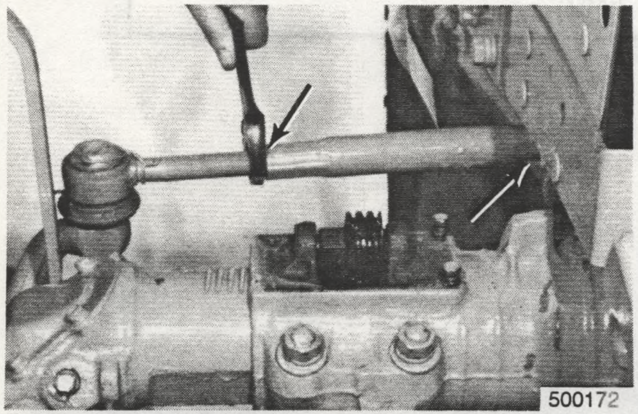


Figure 94: Lock Nut

5. Loosen the lock nuts on each end of the tie-rod adjusting tube.

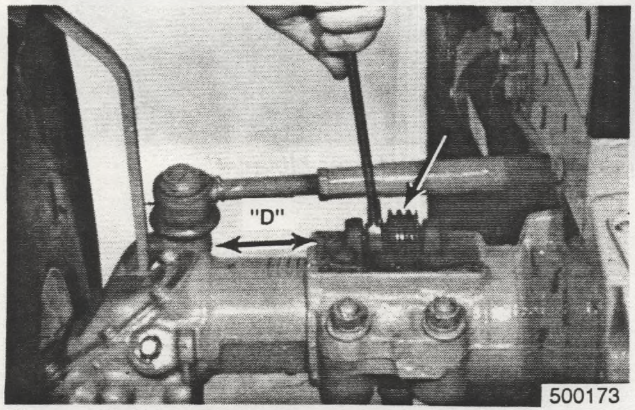


Figure 95: Worm Adjuster

6. Use a wrench to turn the worm adjuster to move the extension tube in or out of the sleeve to the required "D" dimension shown in the chart (Figure 90).

7. Mark the tie-rod adjusting tube and count the number of turns made during adjusting so that the opposite side can be adjusted equally.

NOTE: *Adjust the worm adjuster and tie-rod adjusting tube together in small increments.*

8. After making the correct adjustment, tighten the sleeve clamp bolts and install the worm adjuster cover.

9. If necessary, remove the wheel to change the rim/disc position as indicated in the chart (Figure 90). Repeat the above procedure for the opposite wheel.

NOTE: *Do not tighten the tie-rod adjusting tube lock nuts until after checking and/or adjusting front axle toe-in. See "Adjusting Front Wheel Toe-In".*

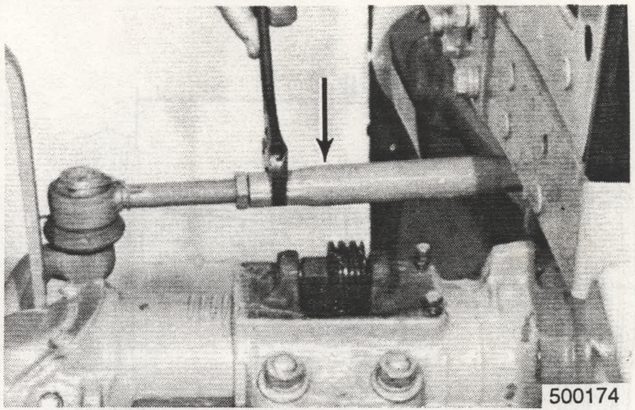


Figure 96: Adjusting Tube

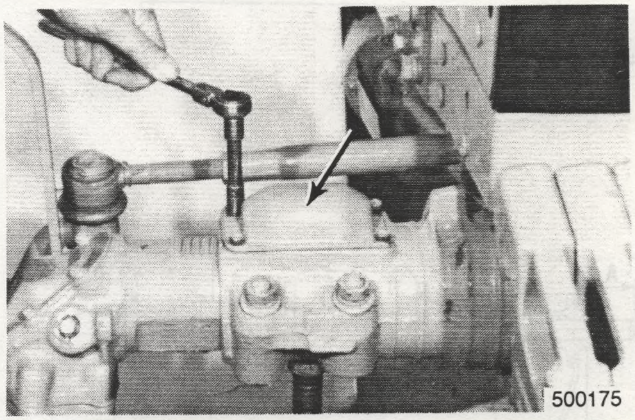


Figure 97: Adjuster Cover

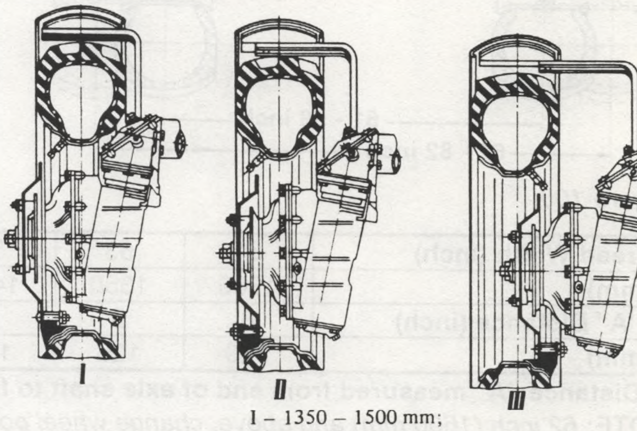


Figure 98:

Non-Adjustable Type Wheel/Disc (P/N 82-3101010)

If your tractor is equipped with non-adjustable style front wheel/disc, front wheel tread width can be adjusted within a range of 55 to 65 inches (1400 to 1670 mm).

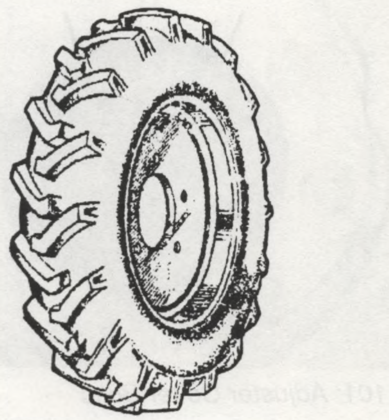


Figure 98A:

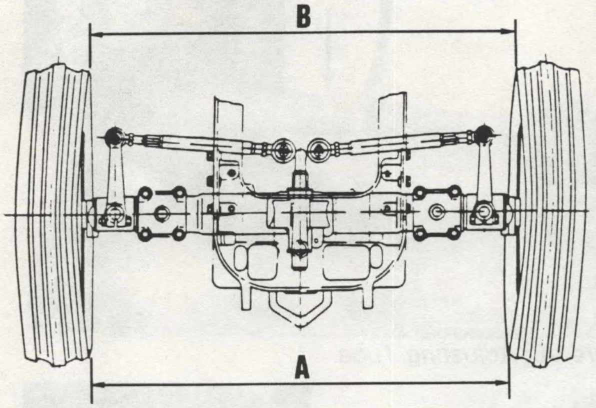


Figure 99:

Adjusting Front Wheel Toe-In

After repositioning the front wheel tread width, reset the toe-in by adjusting the length of the tie-rods equally from side to side. Toe-in is correct when dimension "A" is 0.08 - 0.23 inch (2 - 6 mm) for 2WD models or 0.12 - 0.31 inch (3 - 8 mm) for MFD models, **less** than dimension "B" measured at wheel spindle height.

IMPORTANT: *After toe-in adjustment is complete, tighten the tie-rod adjusting tube lock nuts securely.*

NOTE: *Measure behind the front axle first "B", at wheel spindle height. Move the tractor forward so that the front wheels turn approximately 180°, then measure in front of the axle "A", between the same points as the rear measurement "B" was made.*

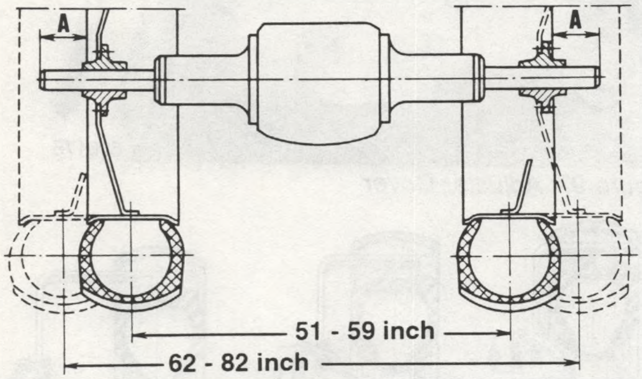


Figure 100:

Rear Wheel Tread Width Setting

Rear wheel tread width is accomplished by a combination of worm screw and/or changing the position of the wheels relative to the disc and wheel hub. The rear wheel center to center tread width is adjustable from 51.0 inch (1300 mm) to 82 inch (2100 mm). The position of the wheels do not need to be changed for wheel tread widths up to 62 inch (1600 mm). To obtain wheel tread width settings 62 inch (1600 mm) and above, change the position of the wheels and hub as indicated in the chart.

Tread Width (inch)	51	53	55	59	62	70	74	82
(mm)	1300	1350	1400	1500	1600	1800	1900	2100
*"A" Distance (inch)	6	5	4	2	flush	4.5	2.5	flush
(mm)	150	125	100	50		114	64	

***Distance "A" measured from end of axle shaft to face of hub.**

NOTE: *62 inch (1600 mm) and above, change wheel positions.*

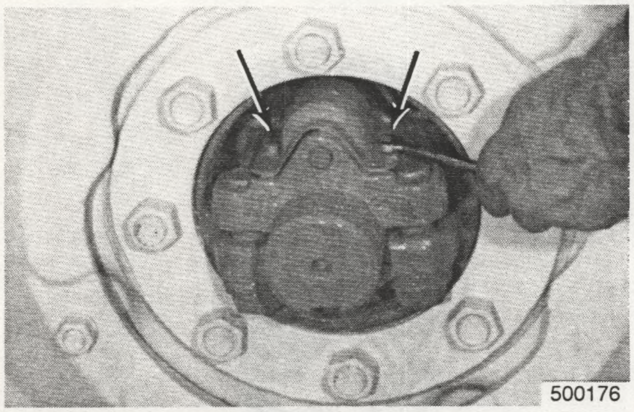


Figure 101: Adjuster Cover Bolts

Procedure:

1. Jack up the rear of the tractor until the wheels are clear of the ground.
2. Remove the adjusting worm gear cover.

3. Loosen the two inner hub clamp bolts 3 to 6 turns.

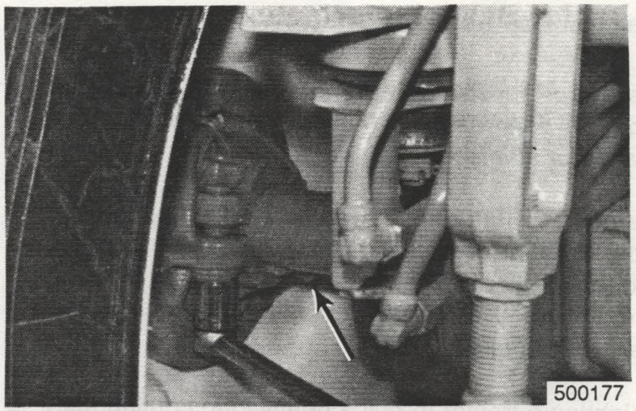


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Figure 102: Inside Clamp Bolts

4. Loosen the two outer hub clamp bolts 3 to 6 turns.

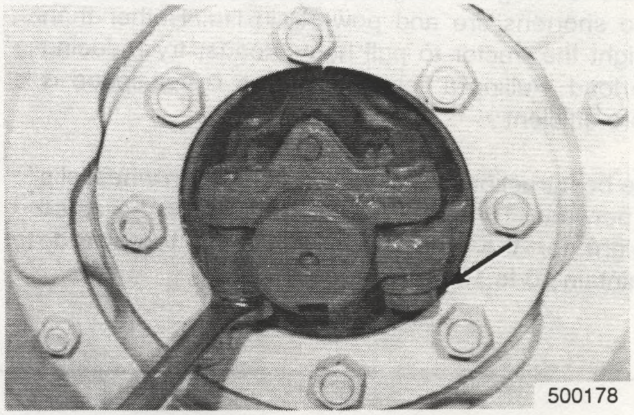

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Figure 103: Outside Clamp Bolts

5. Use a wrench to turn the worm gear as required to obtain the desired "A" dimension shown in the chart (Figure 100) or the desired tread width.

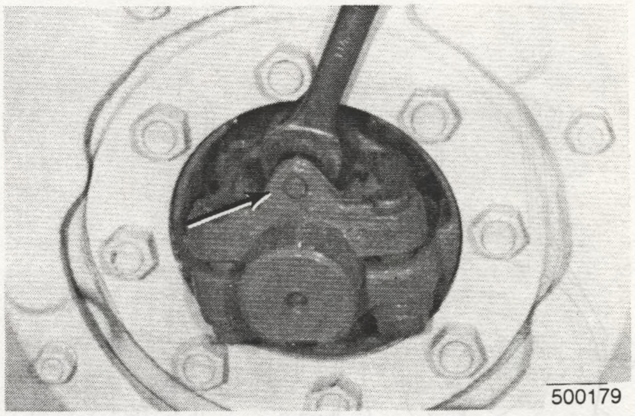

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Figure 104: Worm Adjuster

6. After setting the correct "A" dimension, tighten the four hub clamp bolts and replace the adjuster worm gear cover. Repeat the above procedure for the opposite rear wheel.

   If necessary, change the position of the wheels and hubs to opposite sides of the tractor to obtain the wheel disc to hub relationship shown in the chart (Figure 100) for center to center rear wheel tread widths above 62 inch (1600 mm) and correct tire rotation.

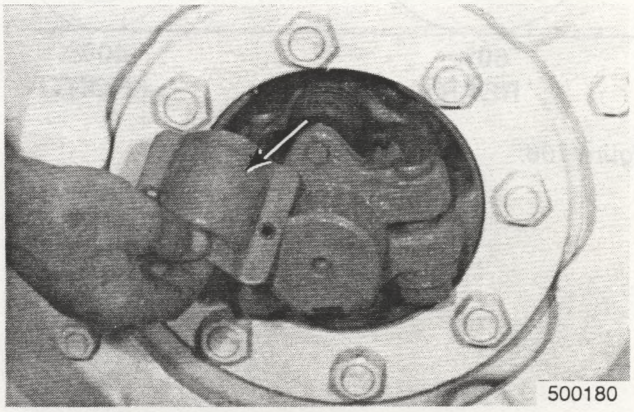

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Figure 105: Cover

Tractor Ballast Information

There are times when it is desirable to weight the tractor to decrease wheel slippage and/or increase balance or stability.

The most important consideration in field operations is the amount of horsepower available at the hitch or drawbar to pull the load. Engine power required to move an overweight tractor means less power available to pull the load.

Weighting a tractor to pull a heavy load continuously in the lower gear ranges is not only inefficient, but also shortens tire and powertrain life. Rather than weight the tractor to pull heavy loads, try reducing the load. Pulling a lighter load at a faster speed is more efficient.

The best traction and tire life occurs when wheel slip is between 10 and 15 percent. A good ballasted weight for the tractor is the weight required to maintain 10 to 15 percent wheel slip.

Front end weights, rear wheel weights or liquid ballast in the tires can be used to ballast your tractor. If liquid ballast is used, use a solution of water and calcium chloride to prevent the water from freezing. A mixture of 3.5 lb (1.59 kg) of calcium chloride per gallon of water will provide slush free protection to -12° F (-25° C) and will become solid at -52° F (-47° C). When liquid ballast is used, inflate the tires two PSI more than the recommended pressure. This will compensate for aeration that occurs when the tire is in motion.

NOTE: *Always remove liquid ballast when it is not needed.*

IMPORTANT: *If dual rear wheels are used, do not use liquid ballast in the outer dual wheels. Using liquid ballast in the outer dual wheels could result in severe damage to the transmission/axle and final drives.*

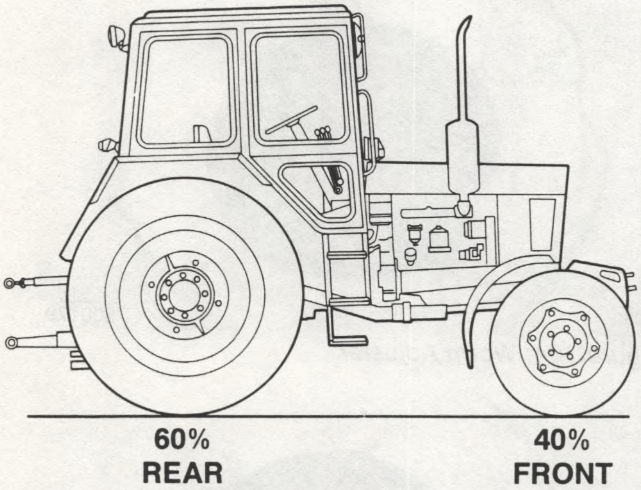


Figure 106:

Tractor Weight Distribution

The correct static weight distribution of a fully equipped tractor (including ballast) will provide maximum traction efficiency and extended tire and powertrain life for the tractor. The type of rear (or front) mounted equipment used will affect the weight distribution to the front and rear tires.

Mechanical Front Drive (MFD) Tractors

Desirable tractor static weight distribution ratio for fully equipped (including ballast) MFD tractors is approximately 60% of the weight on the rear axle and 40% of the weight on the front axle for most implements and/or drawbar applications. Add or remove ballast as necessary to maintain the correct static weight distribution ratio.

Two Wheel Drive (2WD) Tractors

Desirable static weight distribution for 2WD fully equipped tractors (including ballast) will vary depending on application and type of equipment used. Use the static weight ratios shown in the chart.

IMPORTANT: *The total tractor weight with all equipment and ballast must not exceed the maximum recommended operating weight of 12,000 lb (5436 Kg).*

Implement types	%Rear	%Front
Towed - Drawbar	75	25
Semi - Mounted	70	30
Fully - Mounted	65	35

Figure 107:

Front End Weights

Front end weights can be mounted on the front of the tractor with a weight frame. Up to ten individual weights (44 lb (20 Kg) each) can be installed as needed for pulling heavy drawbar loads or mounted equipment, depending on implement application and/or local soil conditions.

Use front weights as needed to provide effective steering control and front end stability. Use rear ballast for front loader applications to improve tractor balance and stability. Always strive to maintain the correct static weight ratio of the tractor and the correct amount of wheel slip.

NOTE: *Remove front weights when using front end loader or other front mounted equipment. If needed, ballast may also be attached to the 3-Pt Hitch linkage when using front end loaders.*

IMPORTANT: *Never exceed the front axle operating weight of 5430 lb (2460 Kg). This includes the weight of the tractor and mounted equipment.*

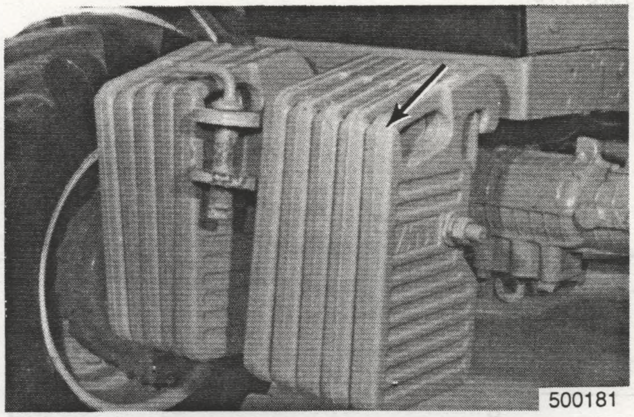


Figure 108: Front Weights

Rear Wheel Weights

To increase rear wheel traction, additional cast iron ballast weights can be fitted to the rear wheel discs. Each ballast weight weighs approximately 44 lbs (20 Kg) and a maximum of four weights per wheel may be fitted for a total ballast weight of 353 lb (160 Kg). Contact your Belarus dealer if rear wheel ballast weights are required.

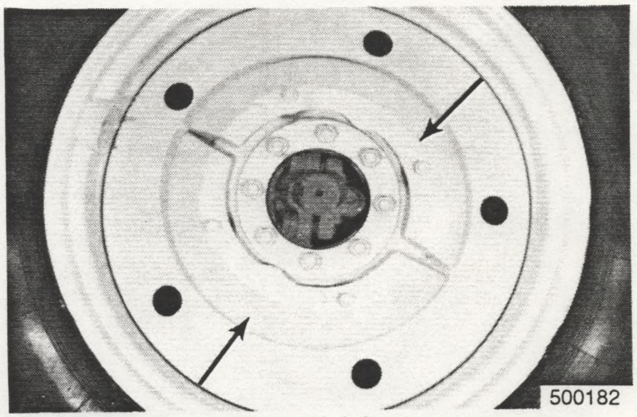
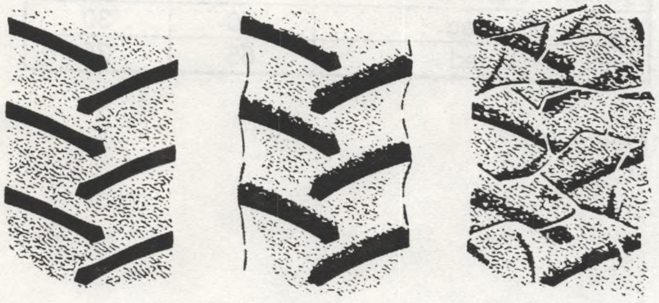


Figure 109: Rear Wheel Weights



TOO MUCH BALLAST CORRECT BALLAST TOO LITTLE BALLAST

Figure 110:

Wheel Revolutions	Percent Slip (%)
9-1/2	5
9	10
8-1/2	15
8	20
7-1/2	25
7	30

Figure 111:

Measuring Wheel Slip

Checking drive wheel tire tracks when the tractor is under load will give an indication if the tractor is ballasted correctly for your local soil conditions. with too much ballast, tread marks will be clear and distinct, showing no slippage, with too little ballast, tread marks will be wiped out by tire slippage.

Ideally, tire slippage should be 10 - 15 percent under load. Check slippage as follows:

1. Put a reference mark on the side of the rear tire.
2. Operate the tractor with the implement in the ground.
3. While the tractor is moving, put a marker on the ground, outside the implement width, where the reference mark on the tire comes down to the ground.
4. Move along with the tractor and count ten wheel revolutions. Put a second marker on the ground outside the implement width, where the reference mark on the tire comes down to the ground for the tenth time.
5. Lift the implement out of the ground. Put the tractor in position and put a new reference mark on the rear tire aligned with the first ground marker.
6. Operate the tractor, with the implement raised, from the first ground marker to the second ground marker. Count the number of wheel revolutions between the two ground markers to find the percentage of wheel slip as shown in the chart.

Tractor Lighting

The standard tractor is equipped with two front head lights. These are 2 stage lights (Hi and Lo beam) for field or highway use.

There are front combination white park lamp and amber colored turn signal lamps mounted on the left and right side of the tractor.

The rear of the tractor is equipped with two flood lamps for field work. There are amber colored turn signal lamps and red tail/stop lamps for night driving. Two red reflectors are also mounted on the rear of the tractor.

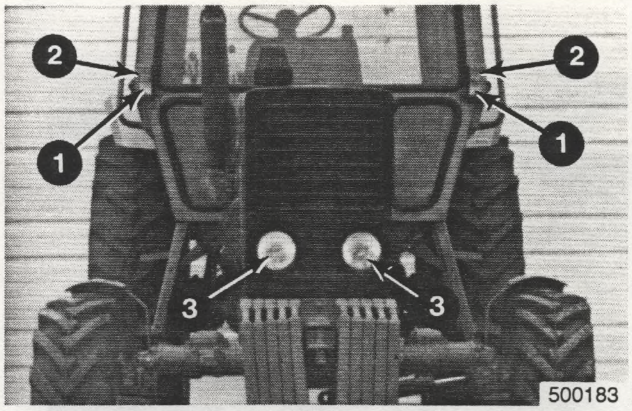


Figure 112: **1 - Park Light** **2 - Turn Signal Lamp** **3 - Head Lights**

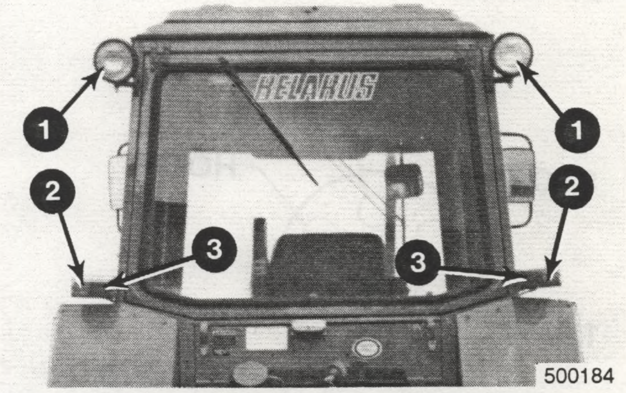


Figure 113: **1 - Flood Lights** **2 - Turn Signals** **3 - Tail/Stop Lights**

Highway Driving

Whenever traveling on public roadways, a slow moving vehicle emblem (SMV) should be displayed from the rear of the tractor. If the SMV emblem is not visible from the rear when implements or trailers are attached, the implement or trailer should also be equipped with a SMV emblem. **Always** check and keep all lights and reflectors clean and in proper working order before driving on public roadways.

Know and comply with local and state laws regulating day or night travel on public roads with towed equipment.

CAUTION: Do not use rear field (flood) lights when driving on public roadways. Use front road lights only. Towed equipment should be equipped with stop/tail and clearance lights.

IMPORTANT: *Some tractor models are not factory equipped with four-way warning lamps. If this tractor is* ***not*** *equipped with four-way amber warning (hazard) lamps, check your local and state regulations regarding the use of amber warning lamps for highway travel. If amber warning lamps are required, arrangements must be made to have them installed before traveling on public roads.*

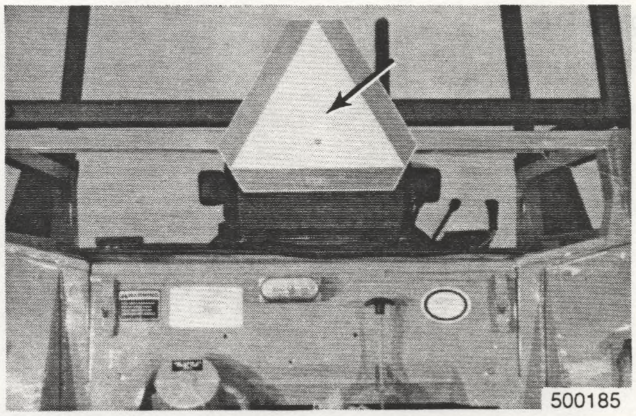


Figure 114: SMV Symbol

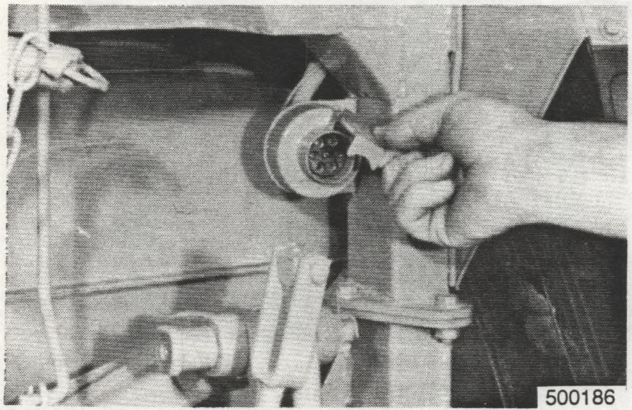


Figure 115:

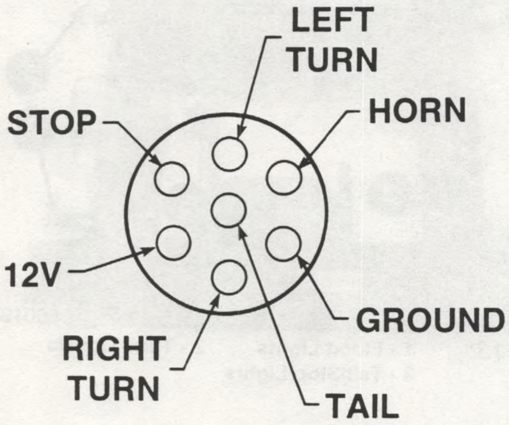


Figure 116:

Rear Auxiliary Power Connection

The seven pin auxiliary outlet socket located at the rear of the tractor will provide electrical power to operate the electrical systems of implements or trailers.

If the implement or trailer plug is not a seven pin connector plug, the plug must be changed. A Seven Pin Connector Plug Kit is available from your Belarus dealer.

NOTE: *Refer to the electrical schematic to determine the socket pin numbers and usage as viewed from the rear of the tractor looking into the socket.*

Properly Maintained Equipment Is Safe Equipment

It is the operator's responsibility to make daily inspections of the machine for loose bolts, fluid leaks, debris or chaff accumulations or anything that could cause a potential service, fire or safety problem.

Lubrication and Routine Maintenance

Lubrication and Routine Maintenance Schedule

The maintenance guide chart indicates the service intervals in hours of operation and/or calendar of time under average tractor operating conditions. However, maintenance schedules depend largely on the tractors **actual** operating conditions. Some checks may have to be performed more often under heavy dust, mud, sand, cold weather, or other severe conditions.

The maintenance schedule check sheet is designed as a guide until adequate experience is obtained to establish a schedule to meet a specific operating condition.

Establish a maintenance schedule using the check sheet as a guide. The result will be a maintenance program to fit your specific operation.

Your tractor hourmeter is the most reliable method of determining maintenance and service intervals. The following schedule is based on a ten hour day. If operations differ from these figures, base your maintenance schedule on actual operating time. Keep an accurate record of operating time and maintenance intervals.

Belarus Machinery, Inc. does not endorse specific brands of lubricants, we consider it the responsibility of the owner to select quality brand lubricants and the obligation of the supplier to assure that all lube oils meet the applicable specifications.

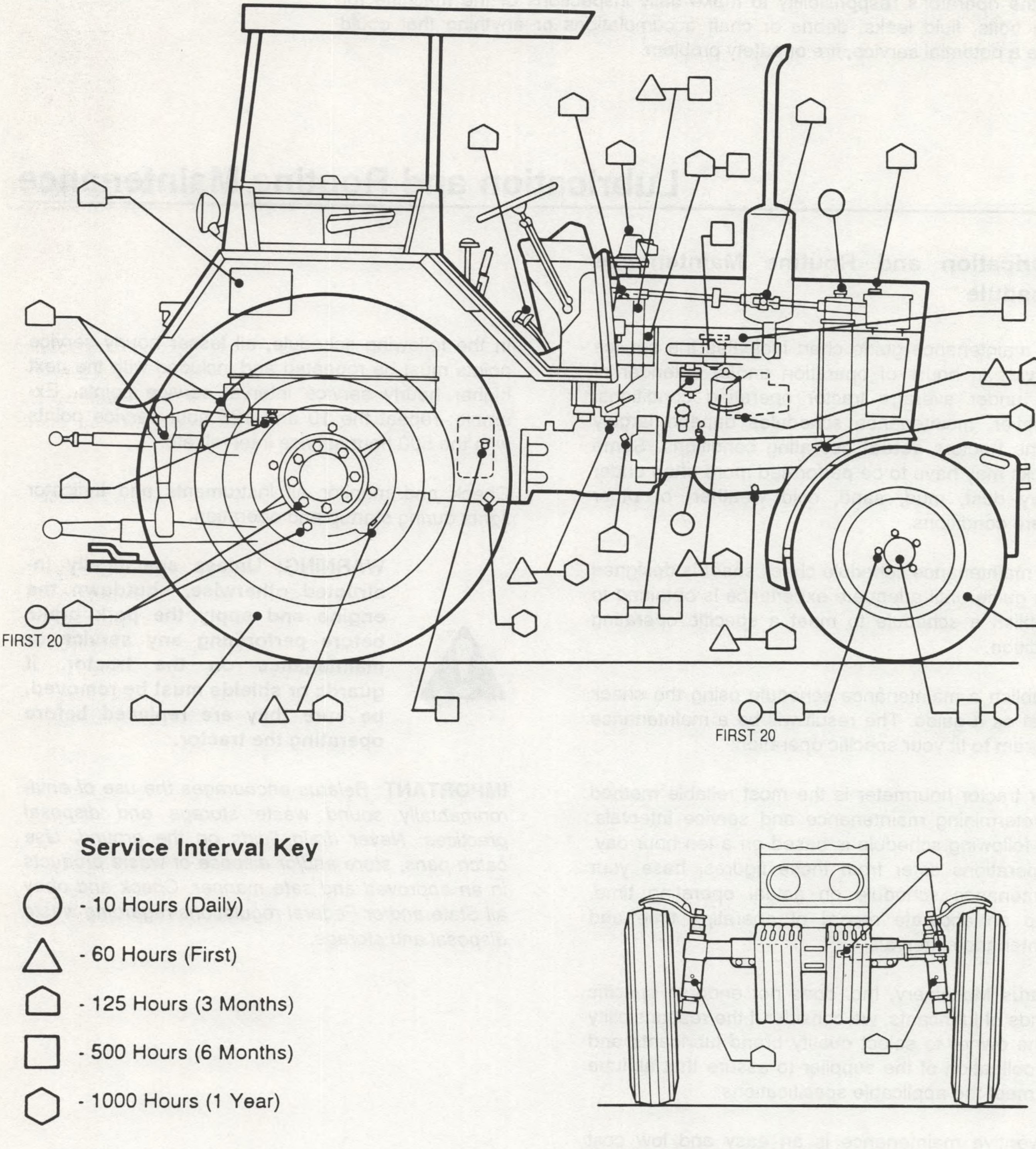
Preventive maintenance is an easy and low cost program to make sure that your tractor gives you many hours of operation without problems.

In the following schedule, all lesser hourly service points must be repeated and included with the next higher hourly service interval service points. Example; repeat the 10 and 125 hour service points with the 500 hour service interval, etc.

Check and monitor all instruments and indicator lights during startup and operation.

WARNING: Unless specifically instructed otherwise, shutdown the engine and apply the park brake before performing any service or maintenance on the tractor. If guards or shields must be removed, be sure they are replaced before operating the tractor.

IMPORTANT: *Belarus encourages the use of environmentally sound waste storage and disposal practices. Never drain fluids on the ground. Use catch pans, store and/or dispose of waste products in an approved and safe manner. Check and obey all State and/or Federal regulations regarding waste disposal and storage.*



2WD Tractor Models

Service Interval Key

○ - 10 Hours (Daily)

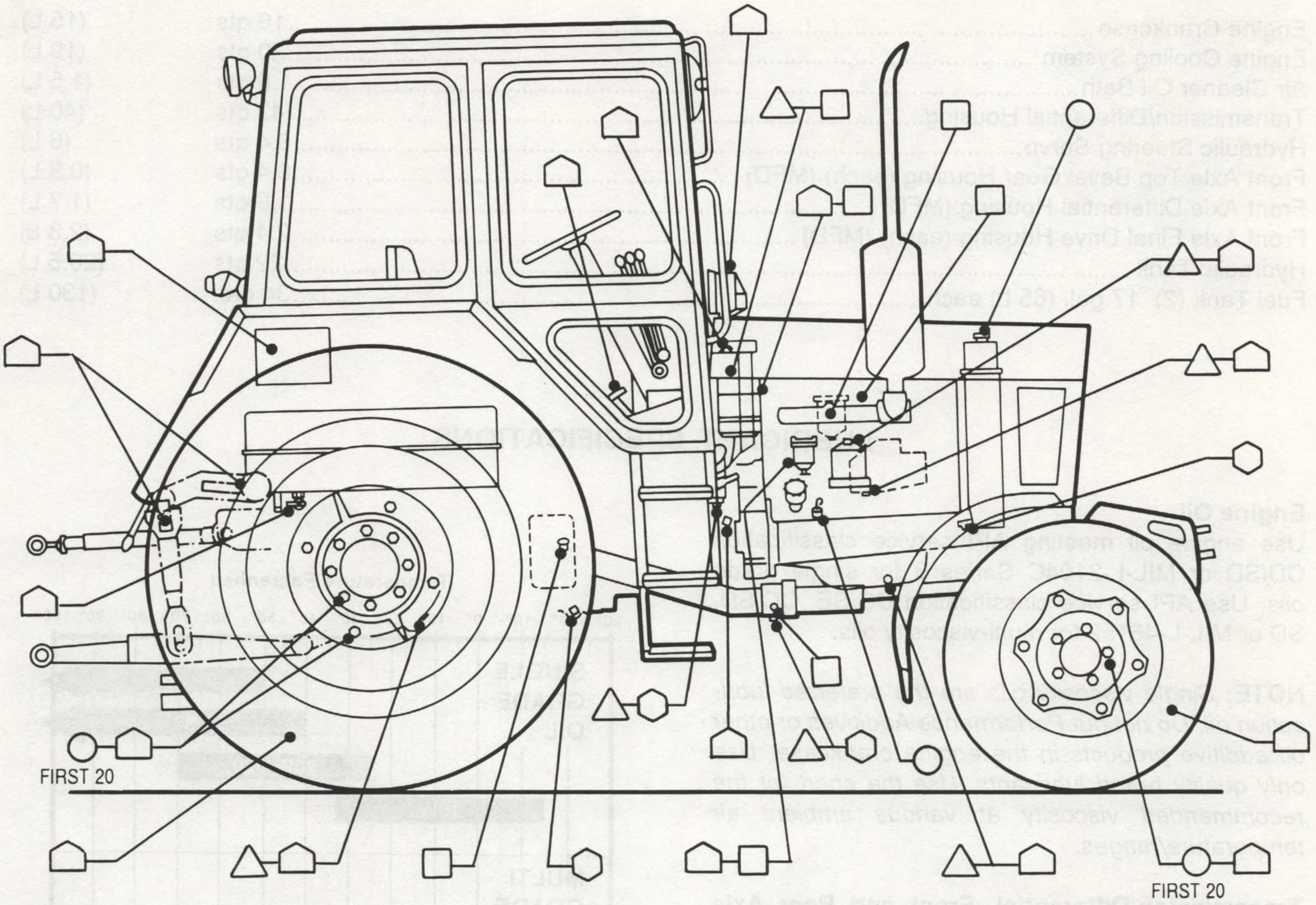
△ - 60 Hours (First)

⬠ - 125 Hours (3 Months)

□ - 500 Hours (6 Months)

⬡ - 1000 Hours (1 Year)

Lubrication and Routine Maintenance



Service Interval Key

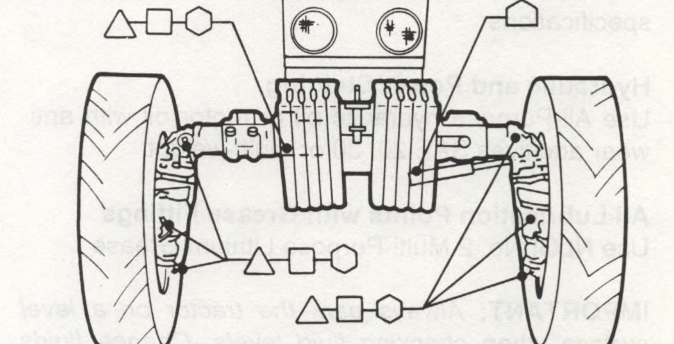
○ - 10 Hours (Daily)

△ - 60 Hours (First)

⌂ - 125 Hours (3 Months)

□ - 500 Hours (6 Months)

⬡ - 1000 Hours (1 Year)



MFD Tractor Models

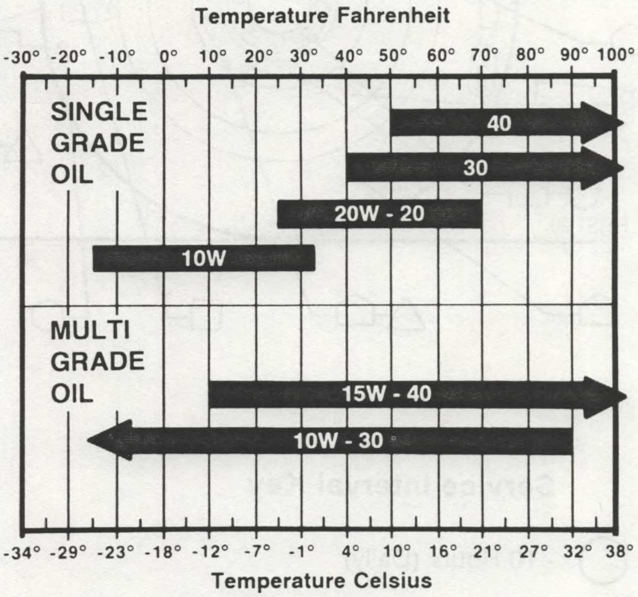
SYSTEM CAPACITIES

Engine Crankcase	16 qts	(15 L)
Engine Cooling System	20 qts	(19 L)
Air Cleaner Oil Bath	1.6 qts	(1.5 L)
Transmission/Differential Housing	42 qts	(40 L)
Hydraulic Steering Servo	6.4 qts	(6 L)
Front Axle Top Bevel Gear Housing (each) (MFD)	0.4 qts	(0.3 L)
Front Axle Differential Housing (MFD)	1.8 qts	(1.7 L)
Front Axle Final Drive Housing (each) (MFD)	2.4 qts	(2.3 L)
Hydraulic Tank	22 qts	(20.5 L)
Fuel Tank (2) 17 gal. (65 L) each	34 gal.	(130 L)

LUBRICANT SPECIFICATIONS

Engine Oil
Use engine oil meeting API service classification CD/SD or MIL-L-2104C Series 3 for single grade oils. Use API service classification CC/SE, CC,SD, SD or MIL-L-46152 for multi-viscosity oils.

NOTE: *Single viscosity oils are the preferred lubrication oil. Do not put Performance Additives or other oil additive products in the engine crankcase. Use only quality brand lubricants. Use the chart for the recommended viscosity at various ambient air temperature/ranges.*



Transmission/Differential, Front and Rear Axle Final Drives, and Front Axle Gear Housing
Use HD SAE 80-90 or 90 gear oils that meet API Classification GL-5 and/or MIL-L-2105B Military specifications

Hydraulic and Power Steering
Use All-Purpose hydraulic oil or motor oil with anti-wear additives SAE 20, 30 or multi-weight

All Lubrication Points with Grease Fittings
Use NLGI No. 2 Multi-Purpose Lithium Grease

IMPORTANT: *Always park the tractor on a level surface when checking fluid levels. Change fluids while the unit is still warm from operating.*

DIESEL FUEL SPECIFICATIONS

Use a good grade of No. 2D diesel fuel as defined by ASTM designation D975 for Diesel Fuels. A blend of No. 1D and No. 2D is permissable when ambient temperatures are consistently below 30° F (-1° C).

ROUTINE MAINTENANCE GUIDE

Using the hourmeter as a guide, perform all services at the hourly intervals indicated.

Service Points	Service Required	Operating Hour Frequency
Fuel tank	Check fuel level	EVERY 10 HOURS (DAILY)
Engine crankcase	Check oil level	
Engine air cleaner	Check restriction indicator	
Cab ventilation filter	Clean	
Air conditioner system (if equipped)	Clean filter	
Engine cooling system	Check coolant level	
Engine	Check for leaks, noise or damage	
General	Check for damage, loose bolts, nuts, fluid leaks etc	
Wheel and hub lug nuts (first 20 hrs)	Torque to specifications	
Repeat 10 Hours (Daily) Service		EVERY 125 HOURS OR (3 MONTHS)
*Engine crankcase	Drain and replace oil	
*Engine oil filter	Disassemble and clean	
*Fuel injection pump	Drain and change oil	
*Turbocharger filter (if equipped)	Replace filter	
Fuel system	Drain primary filter and fuel tank sediment	
Hydraulic tank	Check oil level	
Power steering unit	Check oil level	
Steering system	Grease steering shaft u-joints, bushings, tie rod and steering cylinder ball joints	
Front axle (2WD models)	Grease king pin bushings	
Engine fan belt	Check condition and tension	
Air conditioner compressor belt (if equipped)	Check condition and tension	
Tires	Check condition and inflation pressure	
Wheels	Check wheel and hub nut torque	
Engine air cleaner	Clean, replace oil	
Batteries	Check water level and cable condition	
Three point hitch	Grease linkage	
Engine clutch	Grease release bearing, check free travel	
Brakes	Check and/or adjust free travel	
Repeat 10 Hour and 125 Hour Service		EVERY 500 HOURS OR (6 MONTHS)
Front wheel hubs (2WD models)	Check grease, bearing end play	
Engine valve tappets	Check clearance	
*Hydraulic system	Replace filter, clean vent	
Engine air cleaner	Clean central housing and precleaner	
MFD axle	Check oil levels in housing, final drives, intermediate bearing and side reducing gears. Clean vent.	
Fuel system	Clean first stage filter, replace second stage filter element	
Transmission/Differential	Check oil level, clean vent	
Rear axle final drives	Check oil level, clean vent	
Air induction system	Check for leakage, damage	
Repeat 10, 125, and 500 Hour Service		EVERY 1000 HOURS OR (1 YEAR)
*Hydraulic system	Drain, replace oil and filter	
*Hydraulic steering unit	Drain, replace oil and clean filter and vent	
*Transmission/Differential gear box	Drain, replace oil	
*Rear axle final drives	Drain, replace oil	
*Front axle gear box (MFD models)	Drain, replace oil	
*Front axle final drives (MFD models)	Drain, replace oil	
*Front axle driveshaft intermediate bearing (MFD)	Drain, replace oil, check bearing nut torque	
Front axle toe-in	Check and/or adjust	
Engine cooling system	Drain, flush system and replace coolant	
Fuel pump and injectors	Check, clean and test (see your Belarus dealer)	
Engine cylinder head bolts	Torque to specifications	
Front wheel bearings (2 WD models)	Remove, inspect, repack and adjust	

*Indicates first 60 hours on new machine.

IMPORTANT: *Recommended service intervals are for average conditions. Service more often if the tractor is operated under adverse conditions.*

Engine Compartment Hood

The hood may be opened for servicing the engine or other components. To open the hood, first remove the engine air system precleaner.

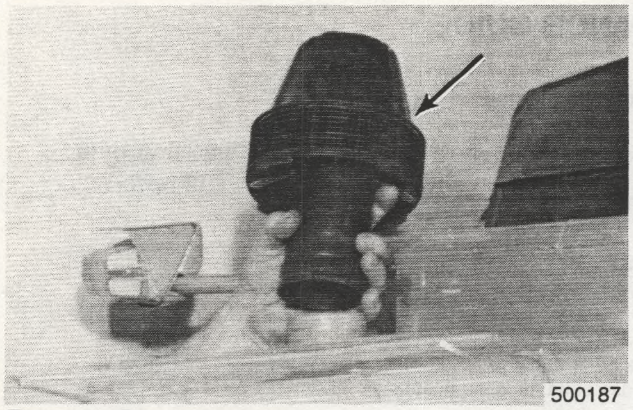


Figure 1: Precleaner

Release the spring clamps located on the left and right rear of the hood.

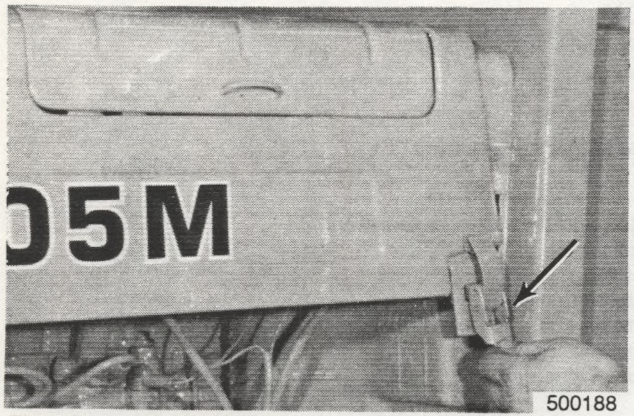


Figure 2: Hood Latch

Lift the rear of the hood up and forward until supported and latched.

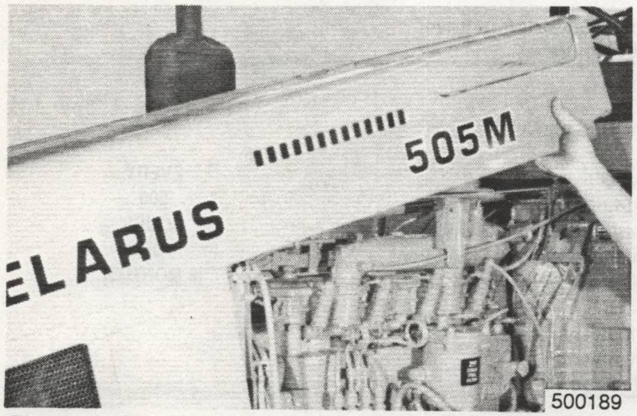


Figure 3: Hood

To close the hood, lift upward on the rear of the hood from the left side. While supporting the rear of the hood, push forward on the support strap to release the latch and lower the hood.

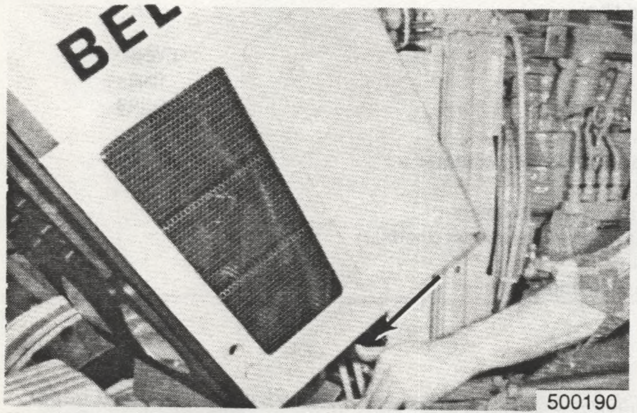


Figure 4: Support/Release Strap

Engine Lubrication System

Checking Engine Oil Level

Check the engine oil level daily. Park the tractor on a level surface and stop the engine. After the engine has been stopped for 5 minutes, remove the crankcase oil level dipstick. Oil level should be at or near the upper (full) mark on the dipstick. If the oil level is below the "add" (lower) mark, add oil of the recommended type. **DO NOT OVERFILL.**

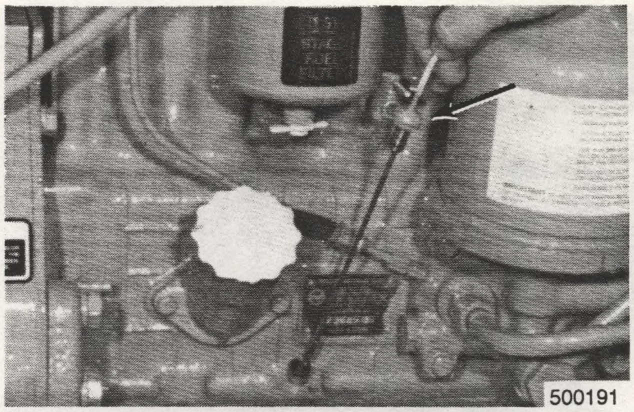

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Figure 5: Oil Level Dipstick

To add oil or fill the crankcase, wipe the area around the fill port cap. Remove the fill port cap.

NOTE: *Periodically inspect the fill port cap o-ring seal for damage or wear.*

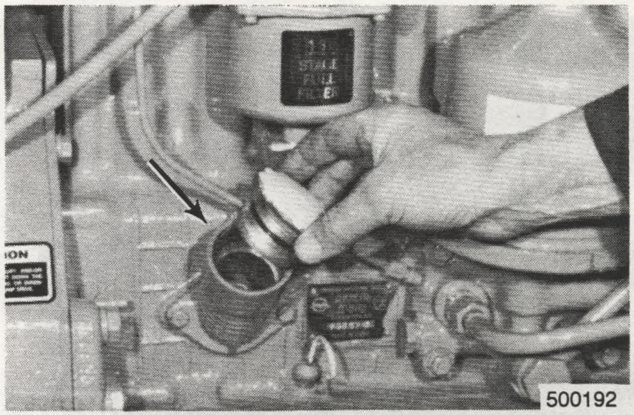
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Figure 6: Oil Fill Port

Changing Engine Oil

Change the engine crankcase oil every 125 service hours (or 3 months). For the best results, remove the drain plug and drain the crankcase while the engine is still warm from operating. Be sure the tractor is parked on a level surface when draining or checking oil level.

After draining, install and tighten the drain plug. Put the recommended type and correct amount of new oil in the crankcase as indicated in the oil viscosity chart.

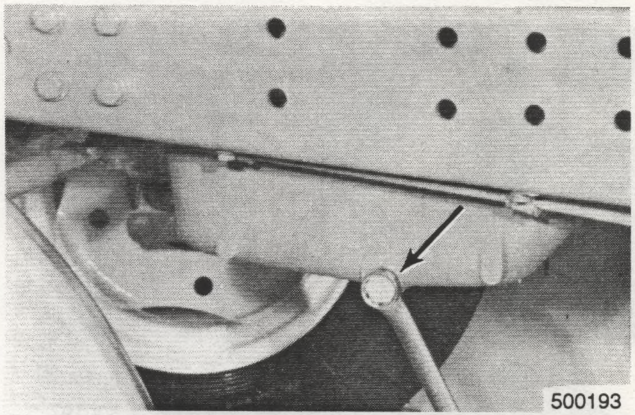
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Figure 7: Drain Plug

Engine Centrifugal Oil Filter

Cleaning the centrifugal oil filter is required each time the engine crankcase oil is changed.

Procedure:

1. Remove the filter housing retaining nut.

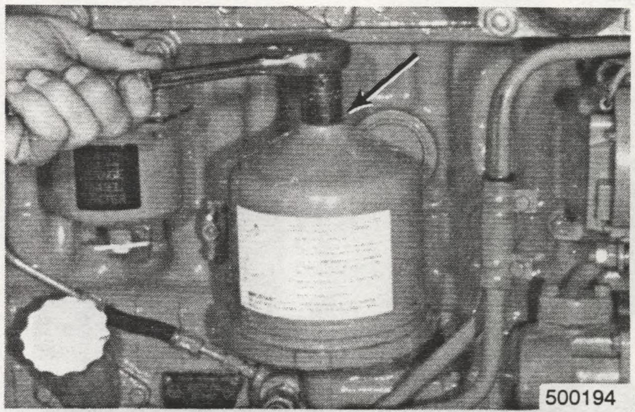
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Figure 8: Filter Nut

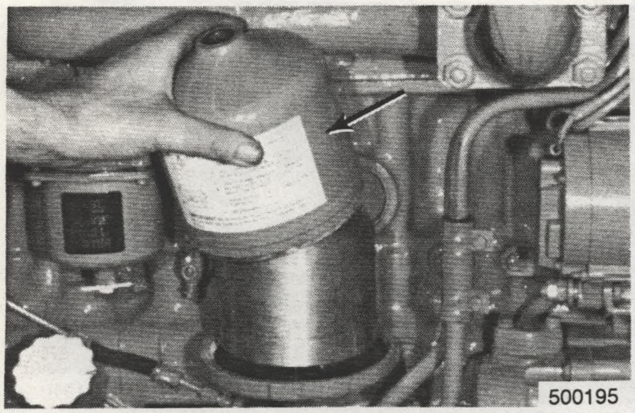
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Figure 9: Housing

2. Remove the filter housing.

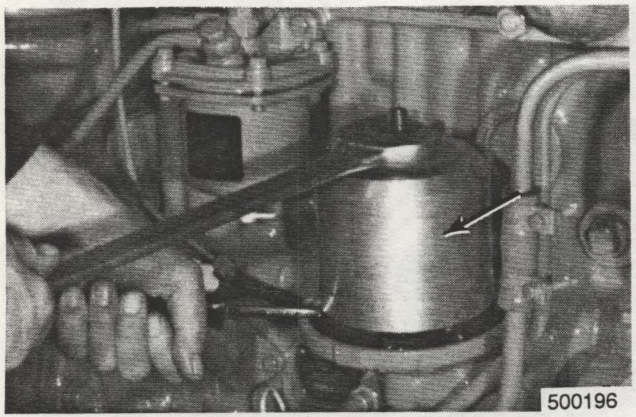
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Figure 10: Rotor Assembly

3. Lift the rotor assembly on the shaft enough to insert a large screwdriver between the boss on the rotor and the rotor shaft as a wedge to hold the rotor while loosening the rotor nut.

NOTE: *There are marks scribed on the rotor cover and boss for balance. Be sure these scribe marks are aligned when installing the cover.*

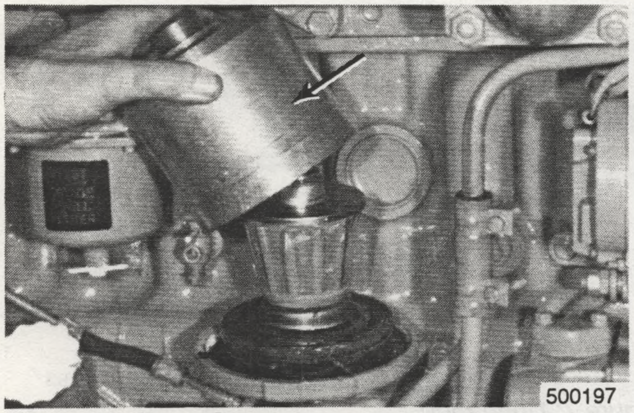
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Figure 11: Rotor Cover

4. Remove the rotor cover assembly.

NOTE: *Oil will come out as soon as the cover is released from the seal.*

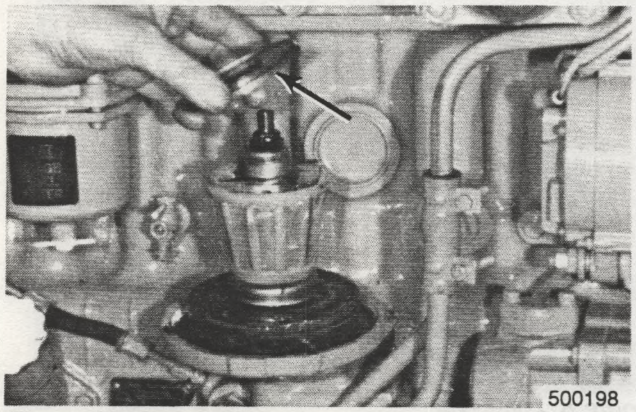
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Figure 12: Screen Cover

5. Remove the screen cover.

6. Remove the impeller.

7. Remove the screen. Wash all parts in clean diesel fuel or cleaning solvent and blow dry. Inspect all parts, and if needed, replace any questionable parts, gaskets or seals before reassembling. Reassemble the filter in the reverse order.

NOTE: *Be sure to align the marks on the rotor cover and boss when installing the rotor cover.*

8. Check the rotor for free rotation after assembly. Install the filter housing and retaining nut.

   Start the engine and run for several minutes. Check for leaks at the filter and all service points. Stop the engine and listen for a coasting (whirring) sound from the filter indicating the rotor is spinning freely.

Turbocharger Oil Filter (900 Series Only)

900 Series tractor models are equipped with an additional spin-on type oil filter located on the left side for the turbocharger. This filter must be removed and replaced at every scheduled oil change interval. Use a filter wrench to turn the filter in a clockwise direction for removal.

Lubricate the new filter seal with clean oil. Install the new filter until the seal contacts the base and hand tighten an additional 3/4 turn.

NOTE: *The Donaldson part number for this filter is P550050.*

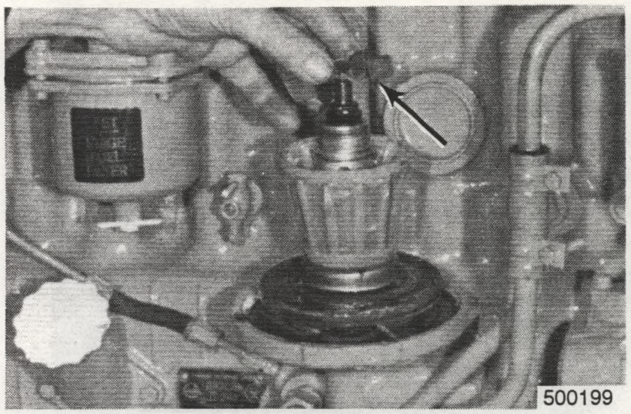


Figure 13: Impeller

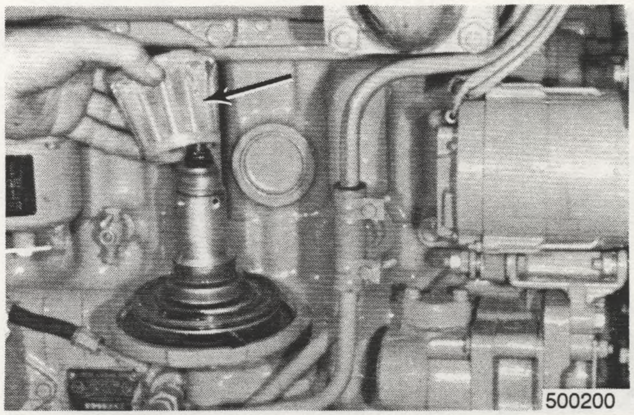


Figure 14: Screen

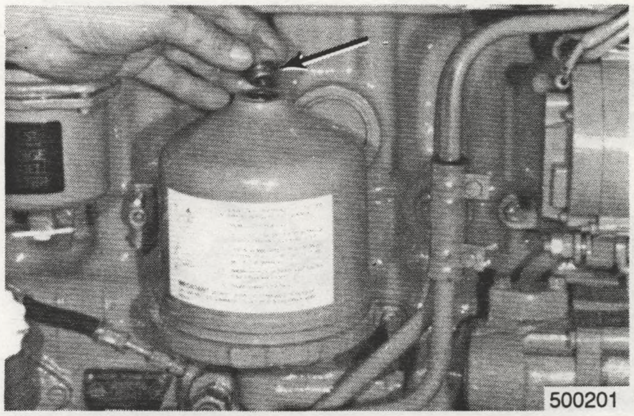


Figure 15: Housing Nut

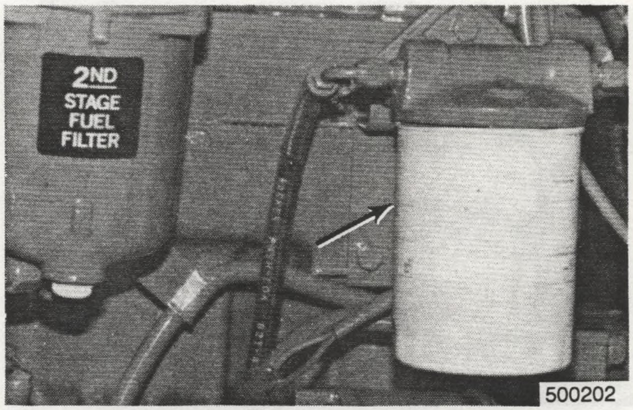


Figure 16: Spin-On Filter

Fuel System

Fuel Injection Pump

The oil in the fuel injection pump housing should be drained at each engine crankcase oil change interval.

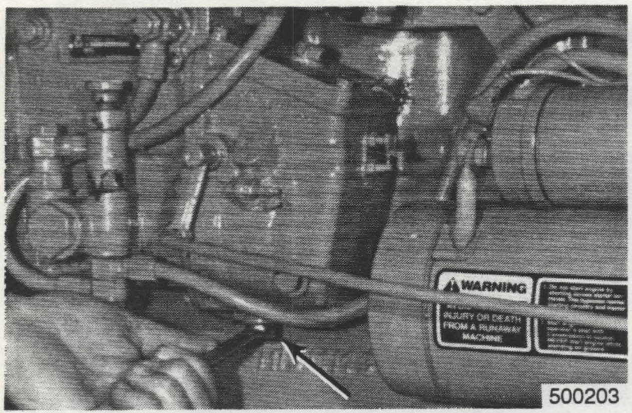


Figure 17: Drain Plug

1. To drain the injection pump housing oil, remove the drain plug located on the bottom of the housing. Install and tighten the plug after the oil has drained.

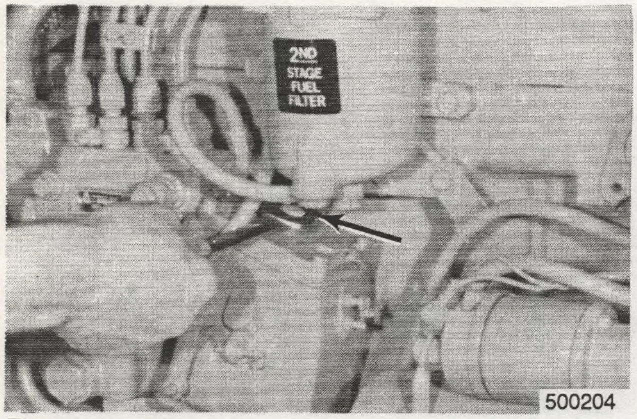


Figure 18: Oil Fill Plug

2. Remove the fill plug located on the top of the housing.

IMPORTANT: *Clean the top of the housing of all dirt and debris before removing the plug.*

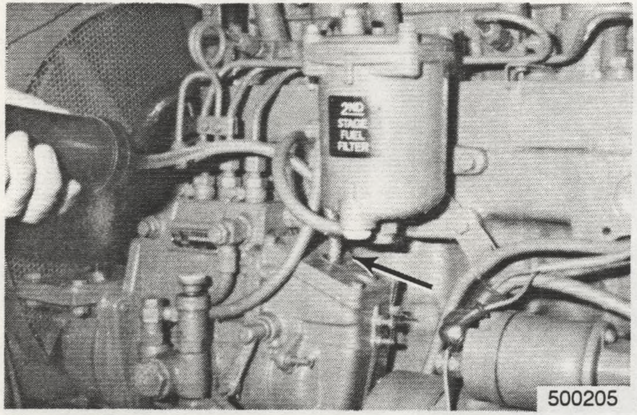


Figure 19:

3. Use a clean suction type lube gun to inject approximately 8 oz. of new oil of the same type as used in the engine.

NOTE: *This is for initial start-up lubrication of the pump. The engine will lubricate the pump after start-up.*

4. Install and tighten the fill plug.

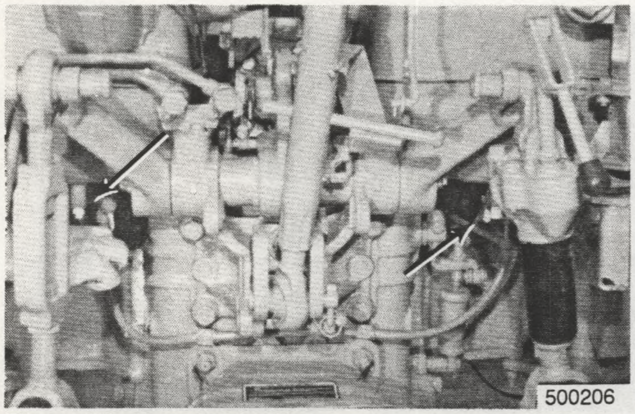


Figure 20: Fuel Drain Plugs

Fuel Tank

Every 125 hours (or 3 months), more often in severe conditions, drain the sediment and water from each fuel tank.

Loosen the plug located on the bottom of each tank until fuel flows clear and tighten the plug.

NOTE: *This should be performed before start-up at the beginning of the day to allow the fuel to settle out overnight.*

Fill the fuel tank at the end of each operating day to prevent condensation from forming on the walls of the tank. Periodically check to make sure the vent hole in the cap is open. Periodically remove and clean the fill port screen.

IMPORTANT: *To prevent dirt and water from reaching the fuel filters and fuel injection parts and cause damage, use clean fuel and fuel containers to keep the fuel clean.*

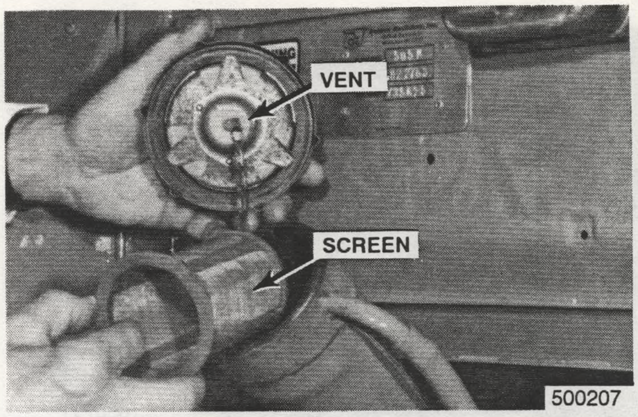


Figure 21: Fuel Cap

Primary Fuel Filter

Every 125 hours (or 3 months), more often in severe conditions, drain the sediment from the first (primary) stage fuel filter.

Every 500 hours (or 6 months), remove the bowl assembly from the filter base. Wash all parts in clean diesel fuel. Check the condition of the bowl seal. Replace the seal if cracked or damaged.

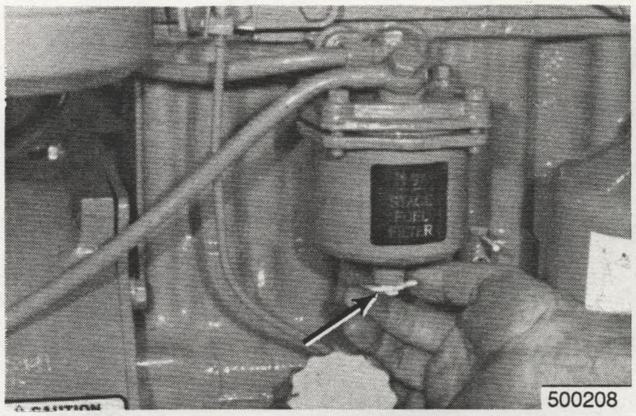


Figure 22: Filter Drain

Procedure:

1. Close the fuel shutoff valve on each fuel tank.

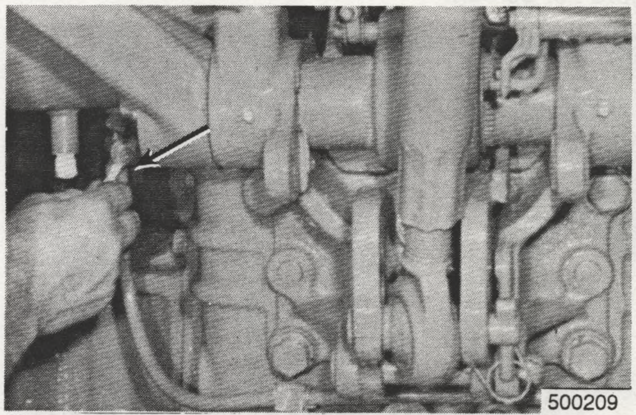


Figure 23: Fuel Shutoff Valve

2. Remove the four bowl retaining bolts.

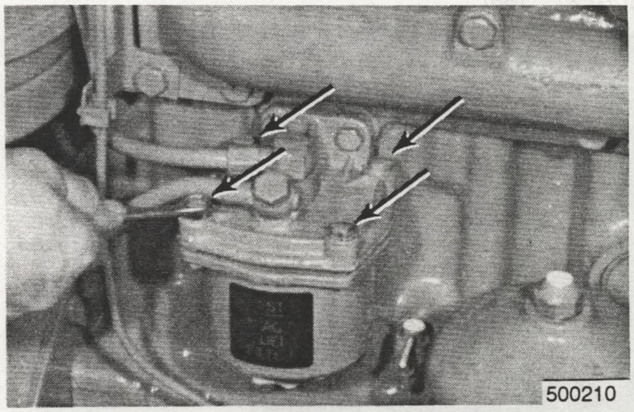


Figure 24: Retaining Bolts

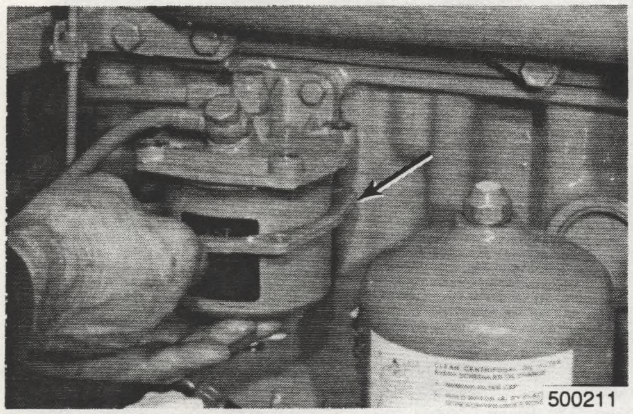


Figure 25: Retainer Ring

3. Remove the bowl and clamp ring.

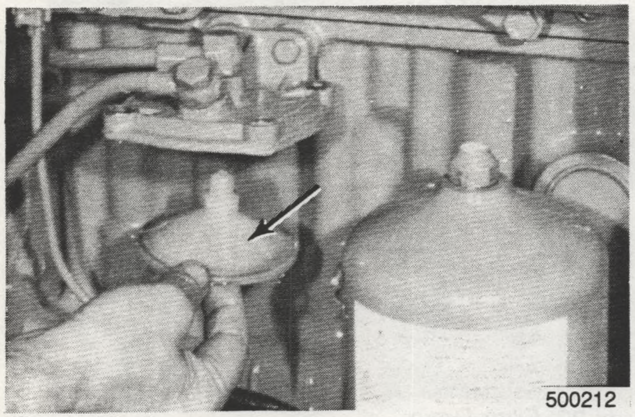


Figure 26: Screen

4. Screw off the filter screen. Carefully wash and clean the filter screen and bowl in clean diesel fuel or solvent.

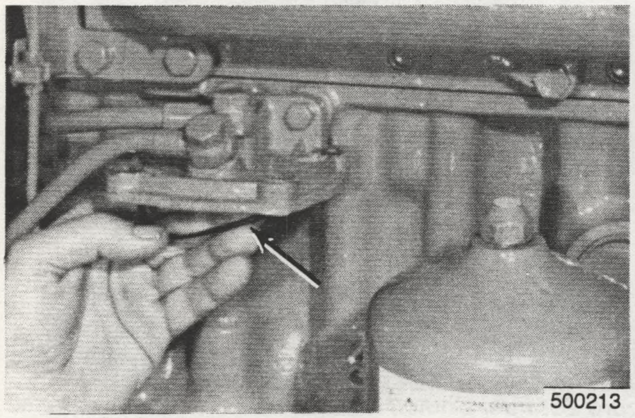


Figure 27: Seal

5. Check the bowl seal in the filter head. If cracked or damaged replace the seal.

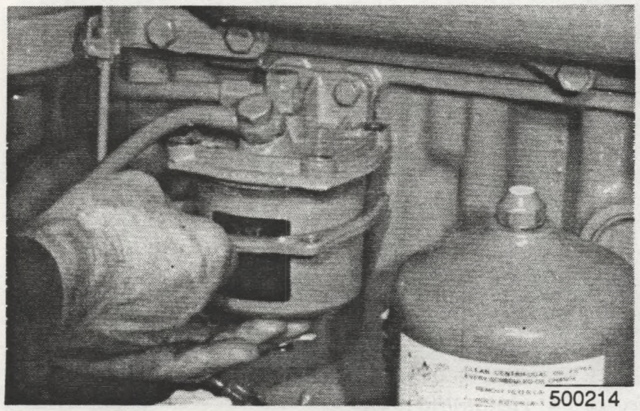


Figure 28:

6. Install the screen on the filter head. Fill the bowl with clean diesel fuel. Position the bowl carefully on the filter head against the seal. Install the retaining ring clamp and bolts. Open the tank shutoff valve.

IMPORTANT: *Tighten the four bolts alternately and evenly to prevent damage or leakage.*

NOTE: *The periodic addition of diesel fuel conditioner can separate moisture from fuel, clean fuel injectors, disperse gum deposits and stabilize fuel in storage. Follow the instructions on the product label when using diesel fuel conditioner.*

Second Stage Fuel Filter

Remove and replace the second stage fuel filter element every 500 service hours (or 6 months) or more often if needed.

Periodically remove the drain plug on the bottom of the filter housing to remove any accumulation of water and sediment or to drain the fuel when changing filter elements.

Changing Second Stage Filter Element Procedure:

1. Close the fuel tank shutoff valve.
2. Clean the filter head of all debris.
3. Remove the filter drain plug to allow fuel and sediment to drain.
4. Remove the four filter housing cover bolts.
5. Remove the bowl cover.
6. Remove and discard the filter element. Wash the housing with clean fuel. Inspect the cover seal in the bowl, replace the seal if cracked or distorted.
7. Install a new filter element in the bowl. Fill the bowl with clean diesel fuel and install the cover and retaining bolts.
8. Open the fuel tank shutoff valves.

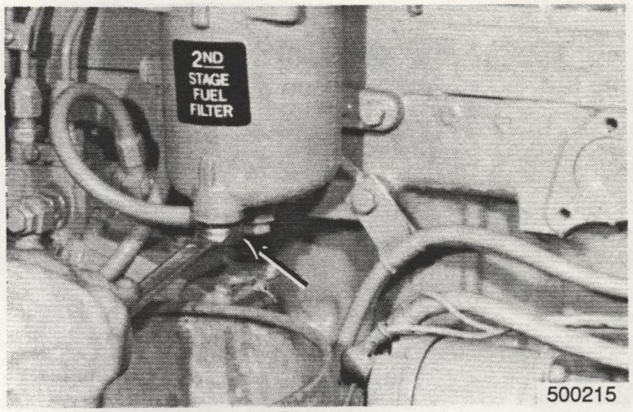


Figure 29: Filter Drain Plug

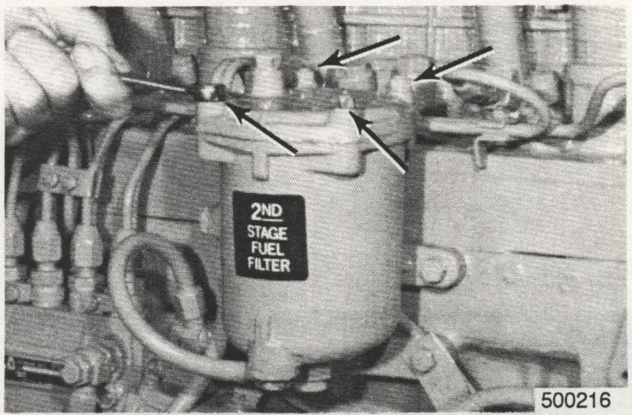


Figure 30: Cover Bolts

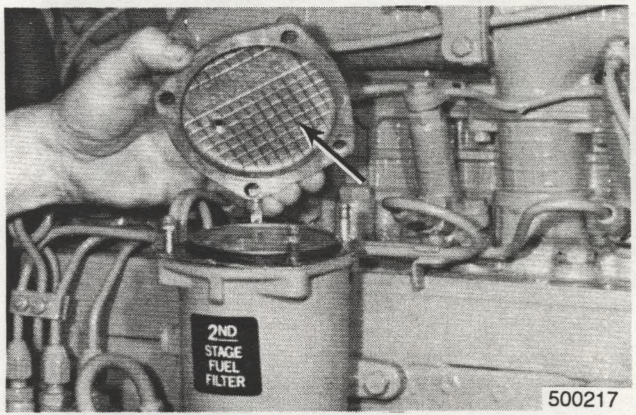


Figure 31: Cover

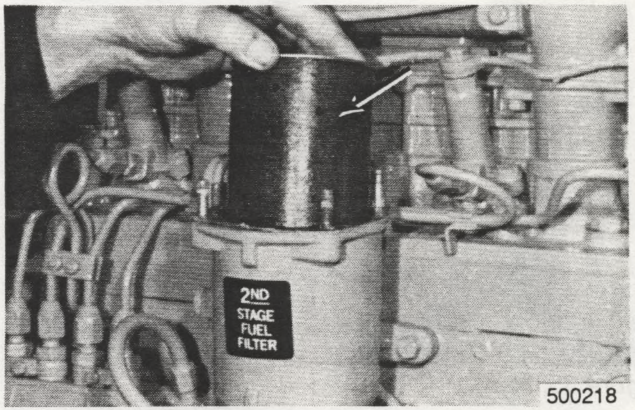


Figure 32: Filter Element

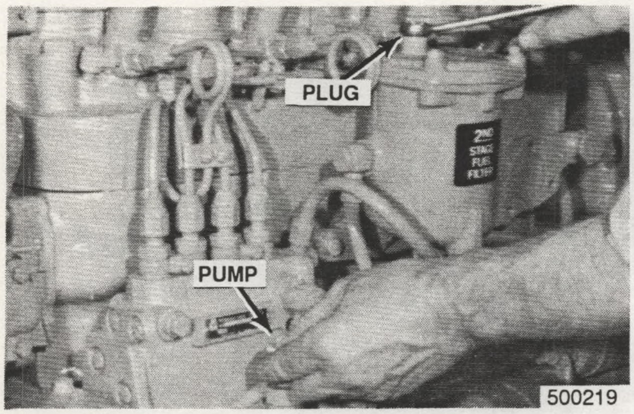


Figure 33:

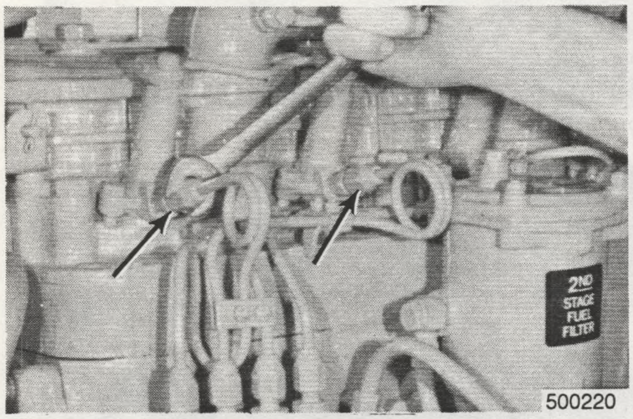


Figure 34: Injector Nuts

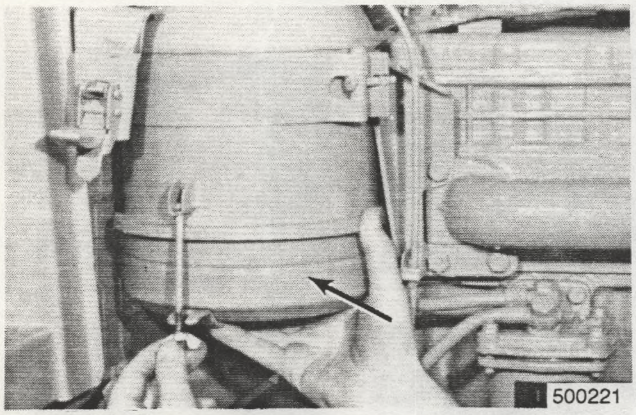


Figure 35: Pan

Bleeding the Fuel System

When fuel filter cleaning and replacement is complete (or if the engine runs out of fuel) the fuel system must be purged (bled) of all air before the engine will start.

Procedure:

1. Loosen the plug on the second stage filter cover.

NOTE: *Be sure the fuel tank valve is open.*

2. Turn the hand priming pump knob counterclockwise until it is released.
3. Stroke the hand priming pump up and down rapidly to fill the filter housing, continue pumping until fuel free from air bubbles flows from the fuel bleed plug. Close the plug. Continue pumping until resistance is felt on the pump, push down and turn the pump knob clockwise until tight.
4. If the engine fails to start, loosen each injector line nut a small amount while cranking the engine to purge the air out of the lines.

NOTE: *Crank the engine only 10 - 15 seconds for each line, tighten the line nut while the engine is still cranking. If the engine starts and still misfires, open and close each line nut while the engine is running.*

IMPORTANT: *Any adjustments or alterations of the fuel pump in any way will void the warranty. See your Belarus dealer for injection nozzle service every 1000 (or 12 months) service hours.*

Engine Air Induction System (500/800 Series)

Every 125 service hours (or 3 months) the engine oil bath air cleaner pan must be removed, cleaned and filled with new engine lube oil.

NOTE: *This service may need to be performed at more frequent intervals in severe chaff, dust or sandy conditions.*

Some 500 and 800 Series Tractor models may be equipped with an air cleaner restriction indicator. If your tractor is equipped with a restriction indicator, the air cleaner must be serviced whenever this indicator locks in the red position.

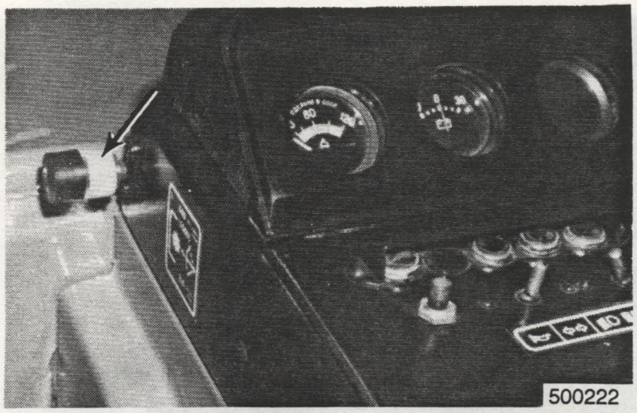


Figure 36: Restriction Indicator

Oil Bath Air Cleaner Service

1. Loosen the pan retainer wing nuts and remove the oil pan. Remove the plastic settling cup. Drain and discard the oil from the pan. Wash all parts in diesel fuel or cleaning solvent.

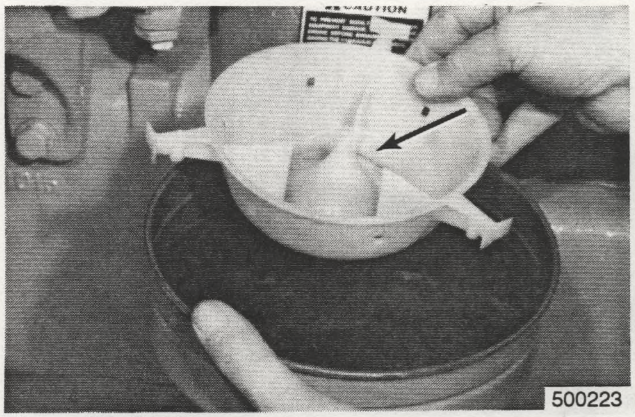


Figure 37: Settling Cup

2. Reinstall the plastic settling cup in the pan, refill the pan with new engine oil to the circular indentation ring on the pan. **Do not overfill.** Install and secure the filter pan to the air cleaner housing.

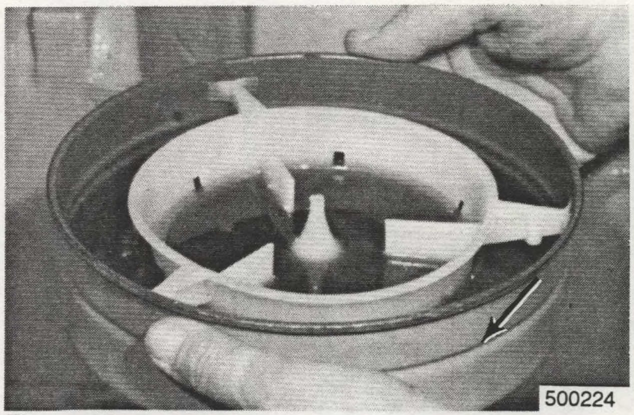


Figure 38: Pan Oil Level

3. Remove and check the precleaner screen. In severe conditions the precleaner screen may require daily cleaning.

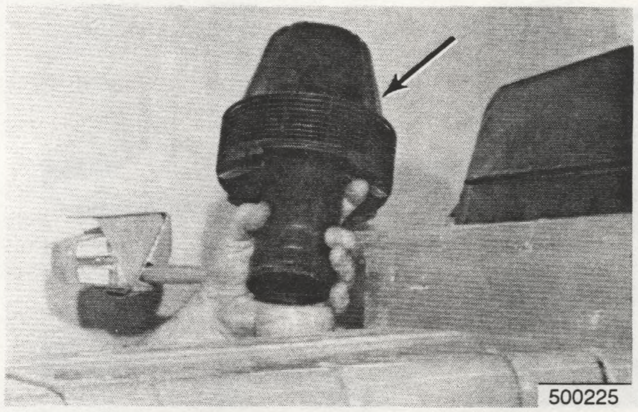


Figure 39: Precleaner

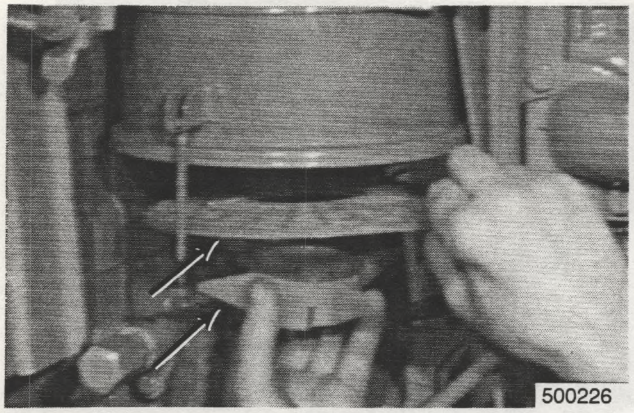


Figure 40:

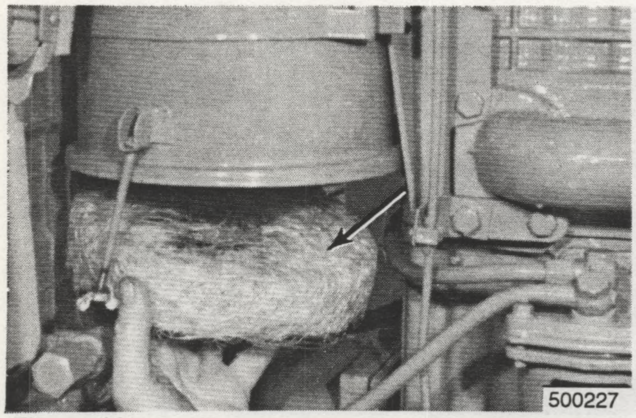


Figure 41:

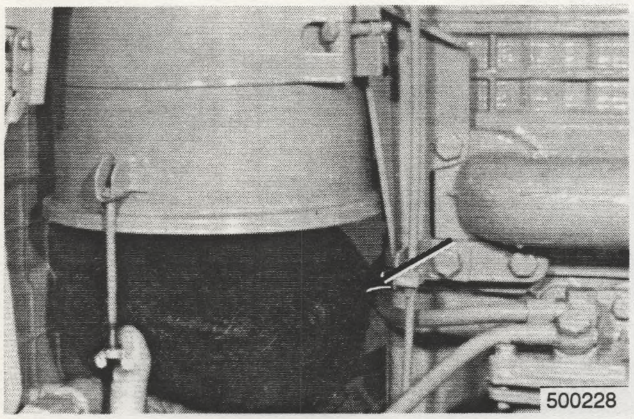


Figure 42:

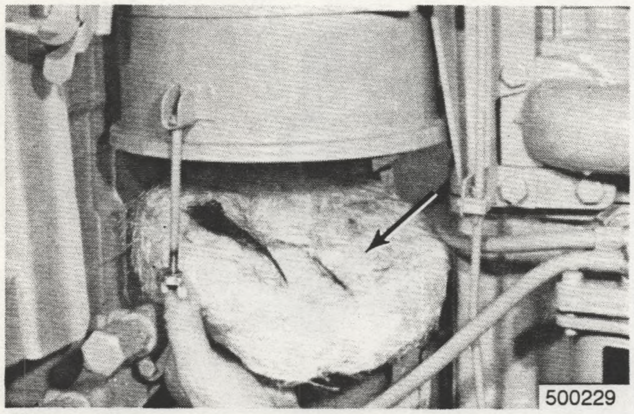


Figure 43:

Air Cleaner Housing

Every 500 service hours (or 6 months) inspect the complete engine air induction system for leaks or damage. Clean the air cleaner as follows:

1. Remove and clean the oil pan. Remove the plastic retainer and grid ring from within the housing.
2. Extract two white fiberglass elements from within the housing.
3. Extract the third black colored fiberglass element from within the housing.
4. Wash the three fiberglass elements and all parts in cleaning solvent or detergent and blow dry. Clean the inside of the center pipe and precleaner.

⚠ **CAUTION: Do not use gasoline or other flammable fluids for cleaning. Use only approved cleaning solvents or detergents for cleaning parts and filter elements.**

5. Reassemble the air cleaner housing and precleaner. Fill the pan to the proper level with new engine oil and install. Tighten the pan retainer bolt wing nuts securely.

Air Cleaner Service (900 Series Tractors)

900 series turbocharged engines use a dry type filter element. This element must be replaced when it becomes restricted.

A filter restriction indicator is located in the air tube connected to the turbocharger. Replace the air filter assembly whenever this indicator locks in the red during operation.

NOTE: *This air cleaner may be purchased under the following vendor part numbers:*

Durolite - C085004
Cummins - 3908719
LEROI - 438672

IMPORTANT: *Periodically inspect the air piping and rubber connection for damage or leakage. Always clean the area around the pipe before removing the air filter to prevent debris from falling into the tube.* ***Never run the engine with the air filter removed.***

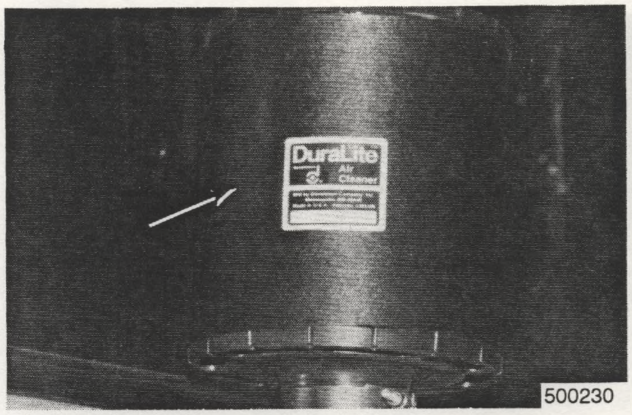


Figure 44: Air Cleaner Assembly

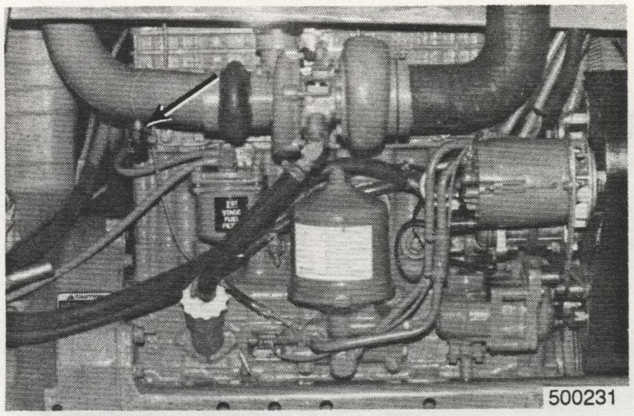


Figure 45: Restriction Indicator

Engine Cooling System

Check the engine coolant level every 10 service hours (daily). Drain and flush the engine coolant every 2000 service hours (or 2 years). Use a 50-50 mixture of clean water and permanent type anti-freeze solution in the cooling system at all times and at all ambient temperature ranges.

CAUTION: This is a pressurized cooling system. Hot coolant can spray out if the radiator cap is removed while the system is hot. To remove the radiator cap, let the system cool, lift the pressure release lever on top of the cap, then wait until all pressure is released before removing the cap.

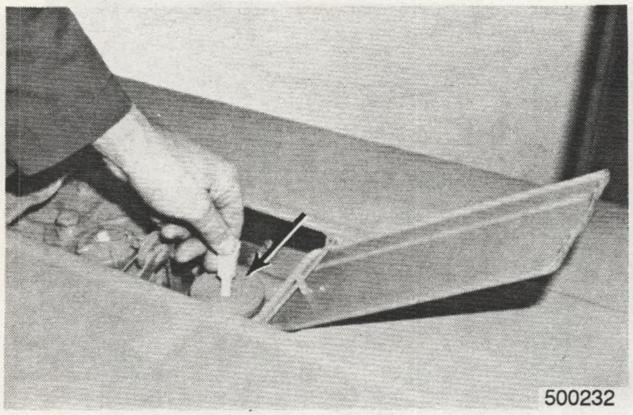


Figure 46: Radiator Cap

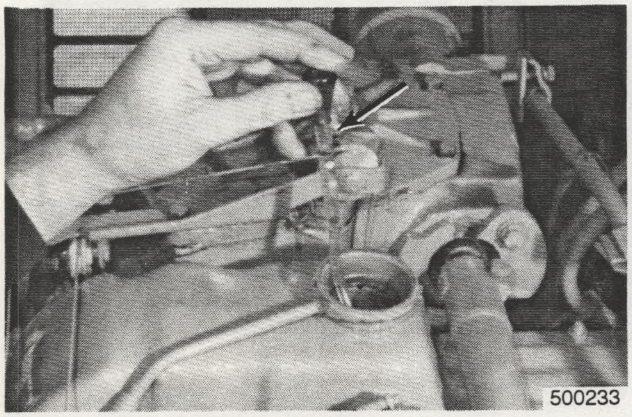


Figure 47: Anti-Freeze Tester

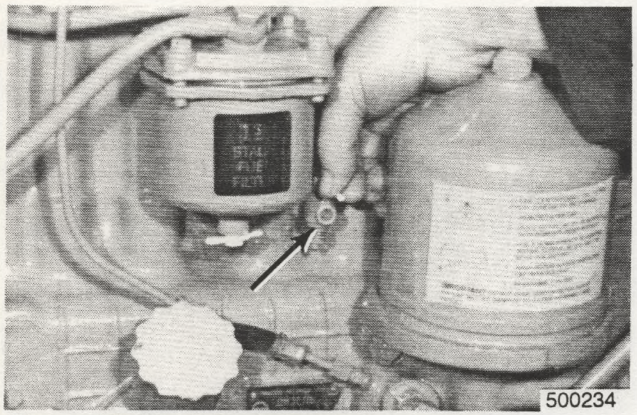


Figure 48: Block Drain Cock

Checking Coolant Level

Check the coolant level only when the engine is stopped and cool. Open the access door at the front of the hood. Lift the pressure release lever on top of the cap to release all pressure before removing the cap. Coolant level must be above the radiator core to the half full level in the tank. If coolant is required, use a 50-50 mixture of clean water and permanent type anti-freeze as make-up coolant.

IMPORTANT: *Never put coolant in a hot engine. This can cause cracks in the cylinder head or engine block.*

Periodically check the level of freeze protection of the coolant. A 50-50 mixture of water and permanent type anti-freeze solution will generally provide slush free protection to -34°F (-37°C).

NOTE: *Using more than 50 percent permanent anti-freeze decreases heat transfer and may cause engine surface temperatures to be higher than normal.*

A pressurized cooling system must have good seals at the radiator cap, hoses and hose connections. It is important to stop all leaks of any size as soon as the leaks are found. Check all hoses and hose connections frequently. Keep hoses, hose connections and pressure cap in good condition.

Cleaning the Cooling System

Every 2000 service hours (or 2 years) the engine block and radiator should be drained, the system flushed and new coolant installed.

1. When the coolant is warm, open the radiator and engine block drain valves. Close the drain valves after the system is empty.

2. Install a good commercial grade of radiator cleaner and fill the system with clean water. Follow the instructions given on the product label for use.

3. Drain the radiator cleaner solution. Flush the system with clean water.

4. Fill the system with new coolant solution as specified.

5. Check and if necessary, use compressed air or high pressure water to clean the radiator core fins of debris.

CAUTION: To prevent personal injury, wear eye protection when using compressed air or high pressure water for cleaning.

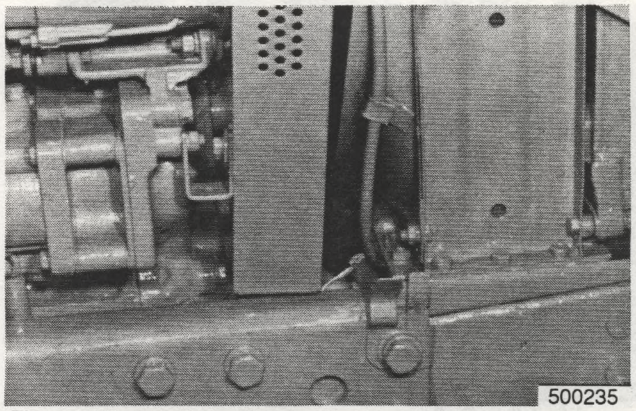


Figure 49: Radiator Drain Cock

Alternator/Fan Belt (Without air conditioning)

Every 125 service hours (or 3 months) check the alternator/fan drive belts for excess wear, cracking, glazing, or fraying. Replace the belts if damage is evident.

To check the belt tension, apply a 9 - 10 lb (4 - 4.5 Kg) force midway between the crankshaft and alternator pulleys. Belt deflection should be 5/8 to 3/4 inch (16 to 19 mm).

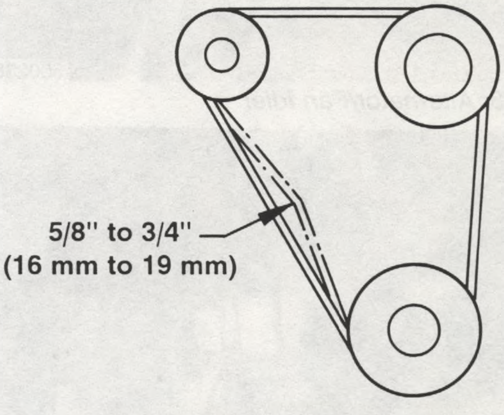


Figure 50:

If belt tension is not correct, reposition the alternator by loosening the alternator mount pivot bolts and tensioning strap bolt. Move the alternator until the belt tension is correct and tighten the bolts.

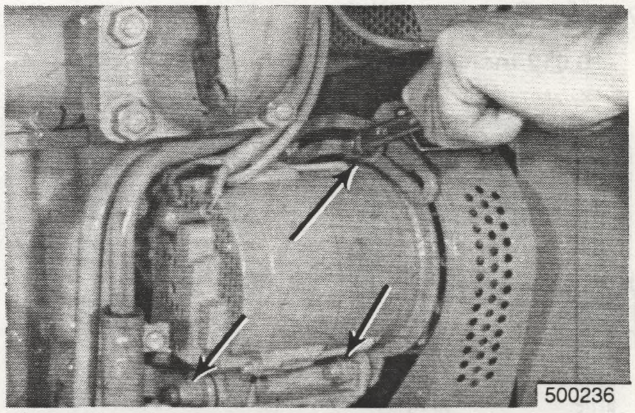


Figure 51: Alternator Mounting Bolts

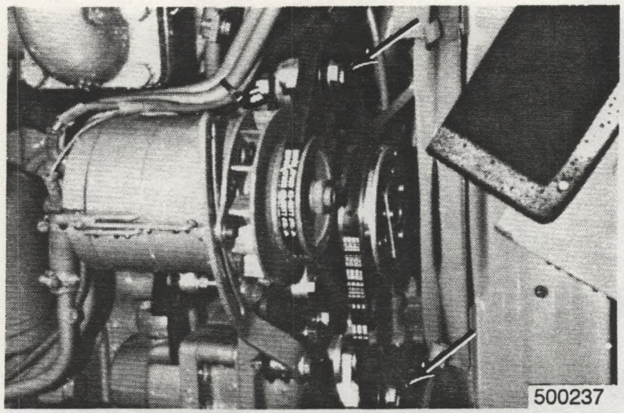


Figure 52: Idler Pulleys

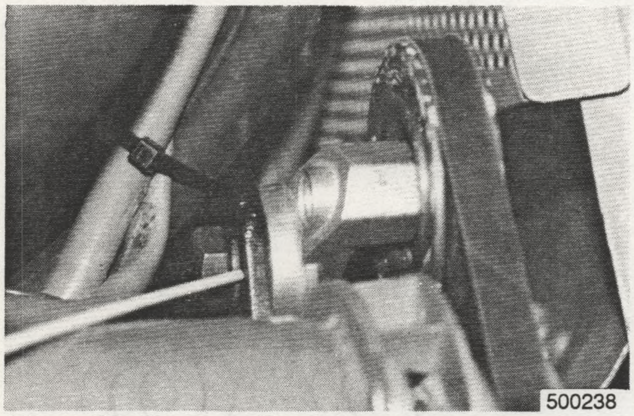


Figure 53: Alternator/Fan Idler

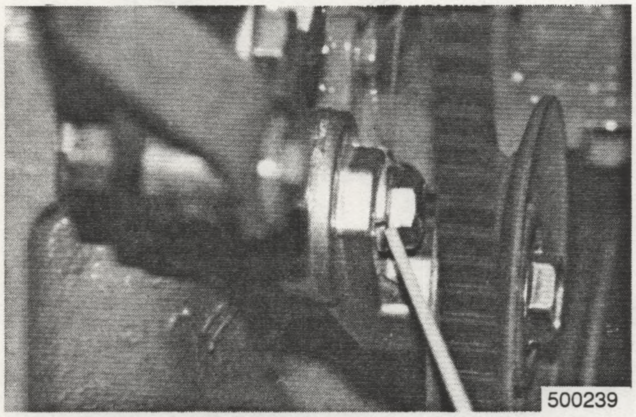


Figure 54: Compressor Idler

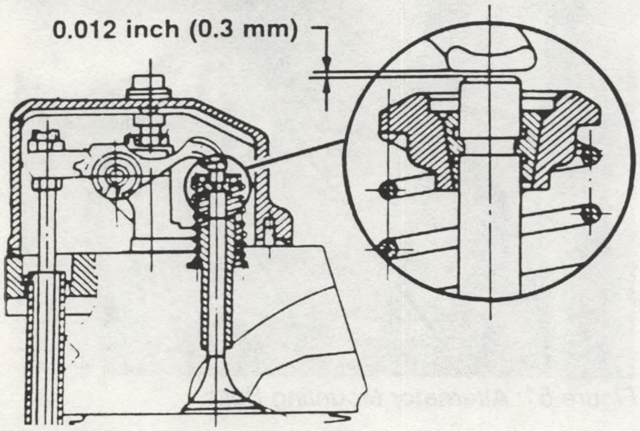


Figure 55:

Alternator/Fan and Compressor Belt (With optional air conditioning)

Tractors equipped with an optional air conditioner system use a different belt arrangement than standard model tractors. Belt tensioning is accomplished on these model tractors by loosening and rotating the belt idler pulleys.

Alternator/Fan Belt
To set the fan and alternator belt tension, loosen the idler pulley pivot bracket mount bolt. Use a wrench on the idler pulley pivot bracket to move and hold the bracket to the correct belt tension. Tighten the bracket mount bolt.

Compressor Belt
To adjust the air conditioner compressor belt, loosen the idler pulley mount bracket bolt. Use a wrench on the pulley bracket to rotate and hold the idler pulley to the correct belt tension. Tighten the pivot bracket mount bolt after the correct tension is set.

Engine Valve Adjustment

After the first 60 hours of operation and every 500 service hours (or 6 months) thereafter, adjust the engine inlet and exhaust valve rocker arm clearance. Check the valve adjustment when the engine is still hot from operation. Valve clearance should not exceed 0.012 inch (0.30 mm) for the intake or exhaust valves.

Procedure:

1. Clean all dirt and debris from the engine valve cover. Loosen and remove the valve cover retaining nuts.

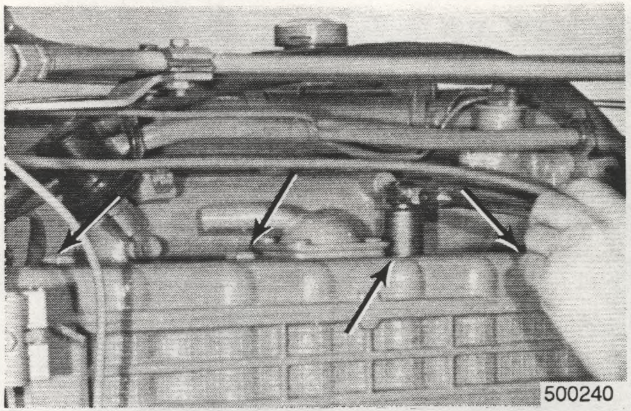


Figure 56: Cover Nuts

2. Remove the valve cover.

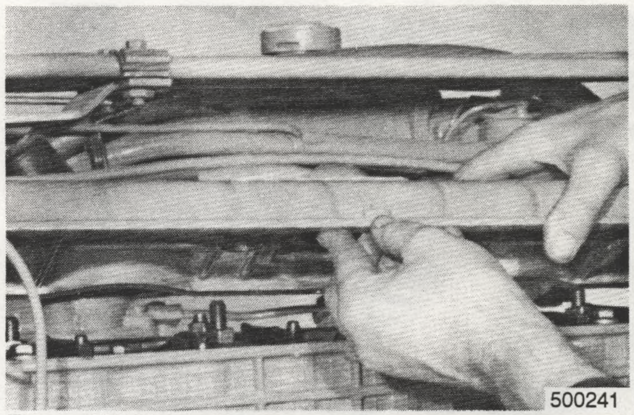


Figure 57: Valve Cover

3. Remove the timing pin from its storage position at the lower right rear of the engine.

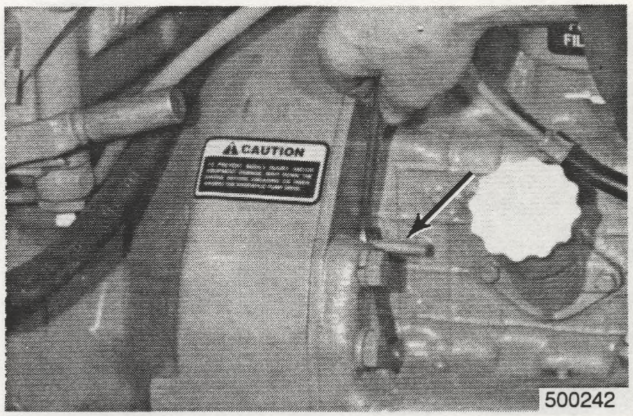


Figure 58: Timing Pin

4. Use a wrench on the crankshaft pulley nut to rotate the engine crankshaft clockwise slowly.

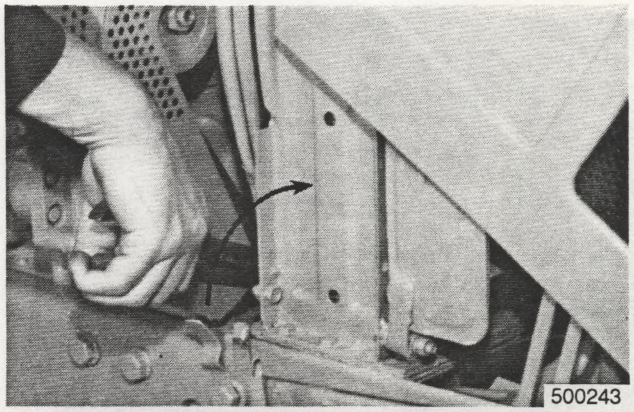


Figure 59: Crankshaft Rotation

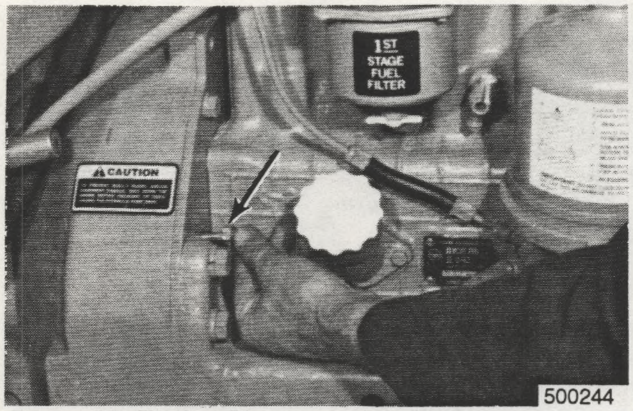


Figure 60: Timing Pin

5. Rotate the engine slowly until the timing pin will go into a hole in the flywheel when cylinder No. 1 is at the end of the compression stroke (TDC) and both valves are closed.

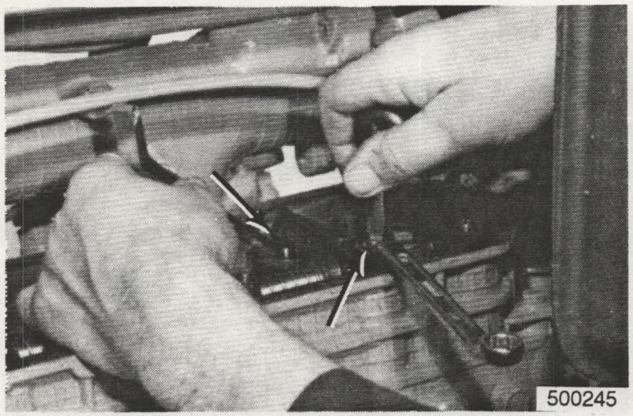


Figure 61:

6. Use a 0.012 inch (0.30 mm) feeler (thickness) gauge to check and adjust the following valves.
   Cyl No. 1 - Inlet and exhaust valves
   Cyl No. 2 - Inlet valve
   Cyl No. 3 - Exhaust valve

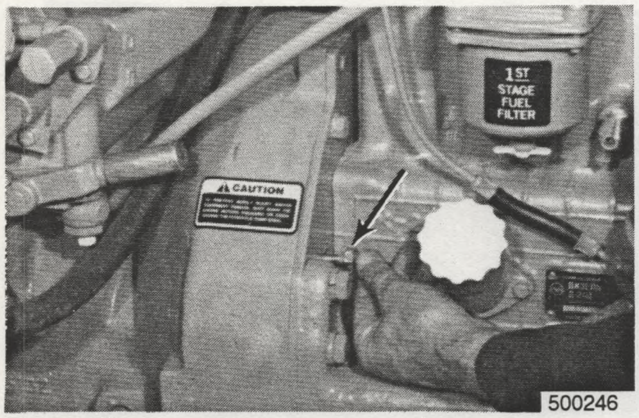


Figure 62:

7. Remove the timing pin and turn the crankshaft through 180° so that cylinder No. 4 is at the end of compression stroke and both valves are closed. Adjust the following valves:
   Cyl No.2 - Exhaust valve
   Cyl No. 3 - Inlet valve
   Cyl No. 4 - Inlet and exhaust valves

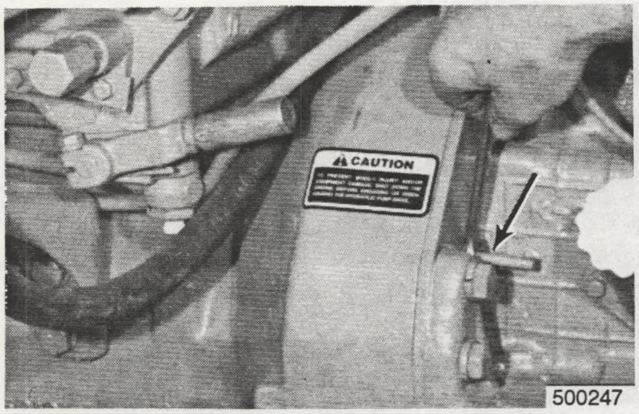


Figure 63:

8. Reinstall and tighten the timing pin into its storage position.

9. Replace the valve cover with a new gasket to prevent leakage. Install and tighten the cover retaining nuts.

Brake System Adjustment

Every 125 service hours (or 3 months) check the brake pedal and park brake hand lever free travel.

Park Brake

The park brake should have from 4.25 to 5.75 inch (110 - 150 mm) free travel at the handle. This would be equivalent to the distance from the bottom of the lever quadrant to the first notch of the quadrant when the brake should start to apply.

CAUTION: Except for emergency situations, do not use the park brake to stop a tractor in motion. Use the park brake to hold the tractor stationary when on slopes and when the tractor is parked. Use the foot pedal operated wheel brakes to stop tractor motion.

Adjustment Procedure:
To adjust the park brake free travel, first loosen the anchor adjusting bolt locknut located under the lever bell crank.

NOTE: *This will be the outer right side lever.*

Turn the adjusting bolt clockwise to reduce lever free travel or turn the bolt counterclockwise to increase free travel as required. Tighten the locknut.

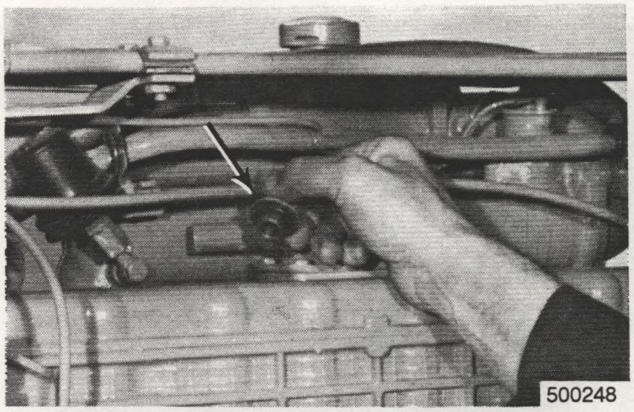


Figure 64: Cover Nut

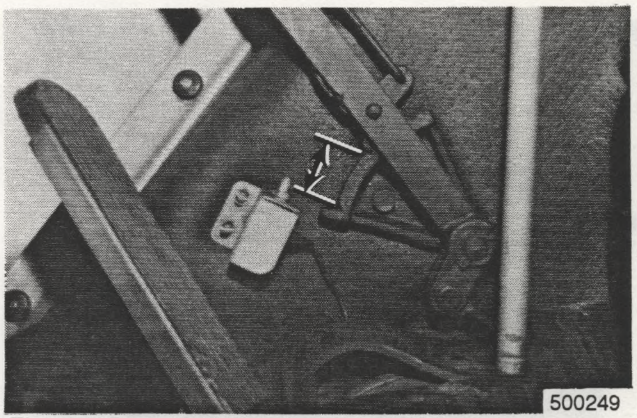


Figure 65: Park Brake Free Play Zone

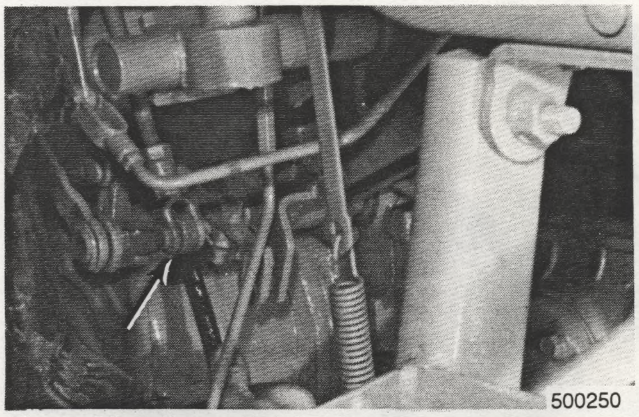


Figure 66: Adjuster Bolt Locknut

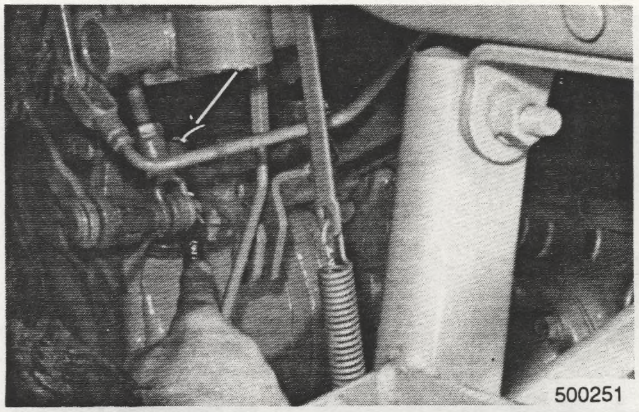


Figure 67: Adjuster Bolt

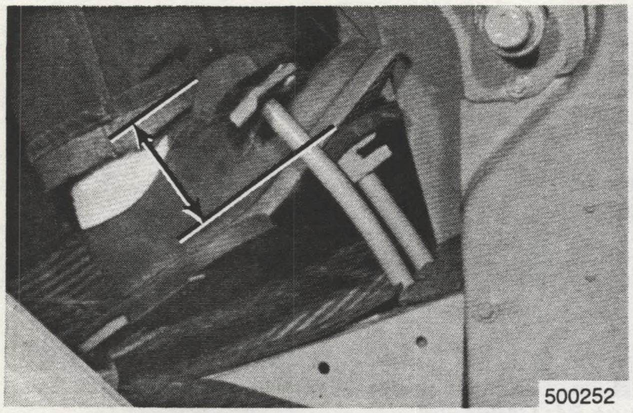


Figure 68: Brake Free Travel

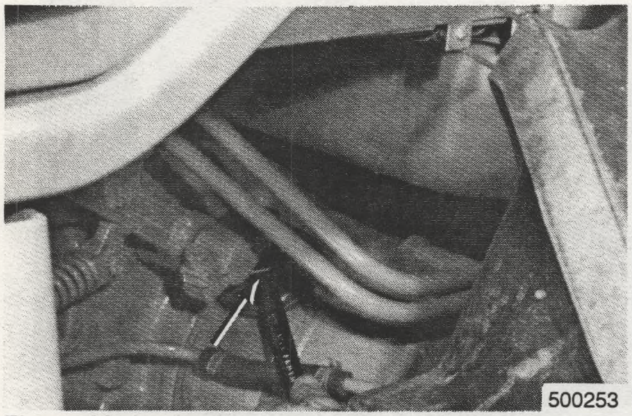


Figure 69: Locknut

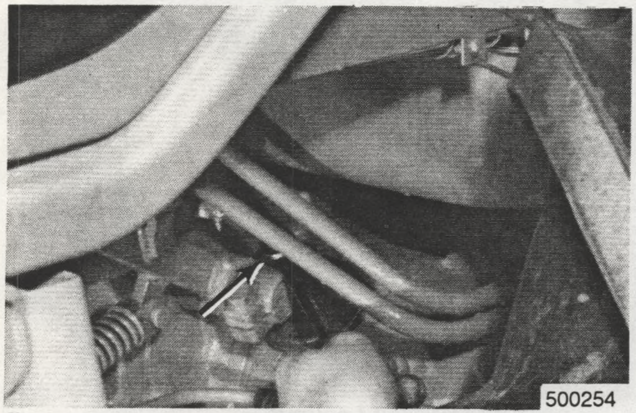


Figure 70: Adjuster Bolt

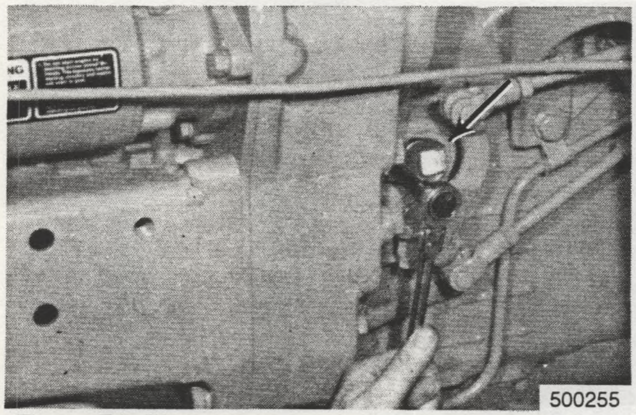


Figure 71: Plug

Rear Wheel Brakes

Each rear wheel brake should have from 2-3 inches (50 - 80 mm) free travel at the brake pedals.

IMPORTANT: *Each brake pedal must have an equal amount of free travel.*

Adjustment Procedure:

1. Loosen the anchor adjusting bolt locknut located under the lever bell crank.
2. Screw the bolt clockwise to decrease free travel or counterclockwise to increase free travel as required. Tighten the locknut.
3. Repeat this procedure for the opposite side wheel brake. Ensure that both brakes have an equal amount of free travel.

Clutch Release Bearing Lubrication

Every 125 service hours (or 3 months) use a hand operated grease gun to inject 2 - 3 shots (pumps) of No. 2 multipurpose Lithium grease into the clutch release bearing.

Procedure:

1. Remove the plug located on the left side of the clutch housing just behind the engine.

2. Use a hand operated grease gun to inject grease into the bearing.

IMPORTANT: *Do not over grease this bushing, excess grease will be thrown off into the clutch housing.*

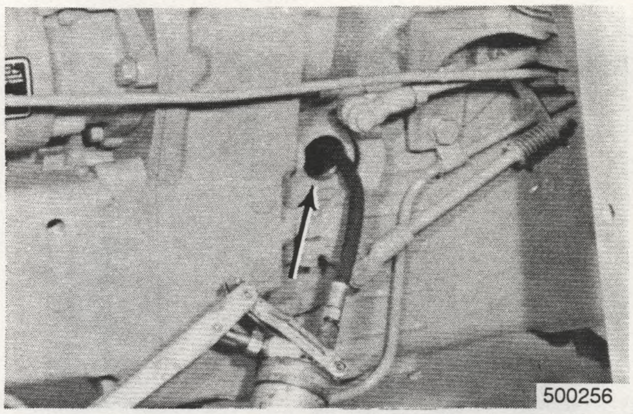


Figure 72: Release Bearing Lubrication

Checking Clutch Adjustment

Every 125 service hours (or 3 months) check the clutch pedal free travel. Too much free travel will not allow the clutch to release completely. Not enough free travel will cause the clutch to slip and fail.

Clutch pedal free travel must be in the range of 1.5 - 2 inches (38 to 50 mm) at the pedal.

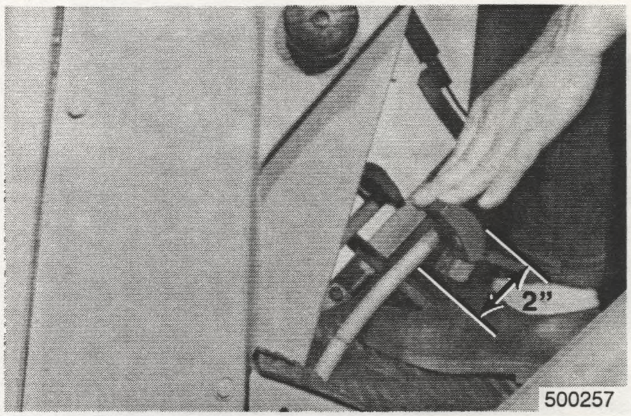


Figure 73: Pedal Free Travel

Clutch Adjustment Procedure:

1. Loosen the upper clutch bell crank clevis locknut.

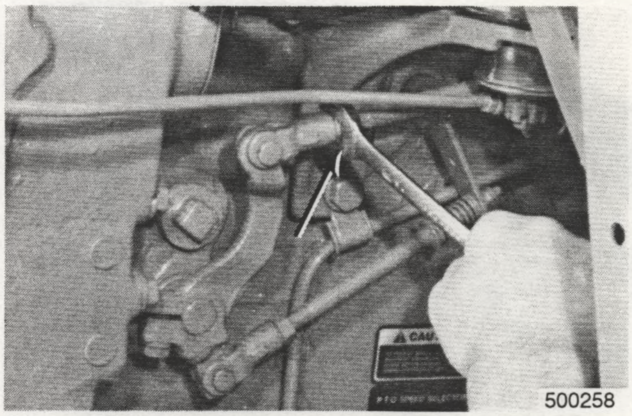


Figure 74: Locknut

2. Loosen the lower clutch bell crank clevis locknut.

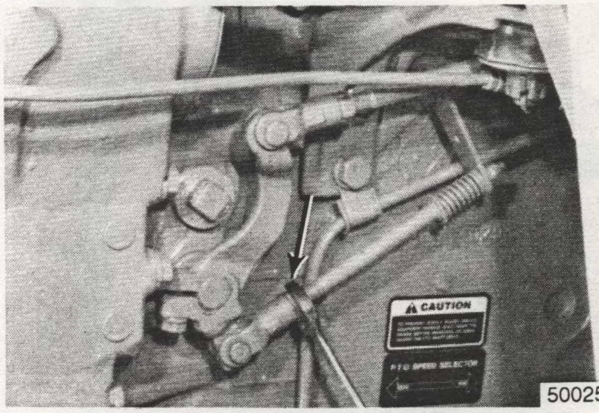


Figure 75: Locknut

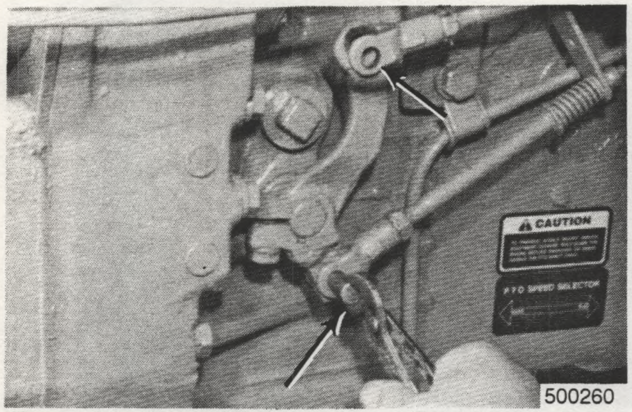


Figure 76: Clevis Pins

3. Remove the clevis pin cotter keys and remove both clutch bell crank upper and lower clevis pins.

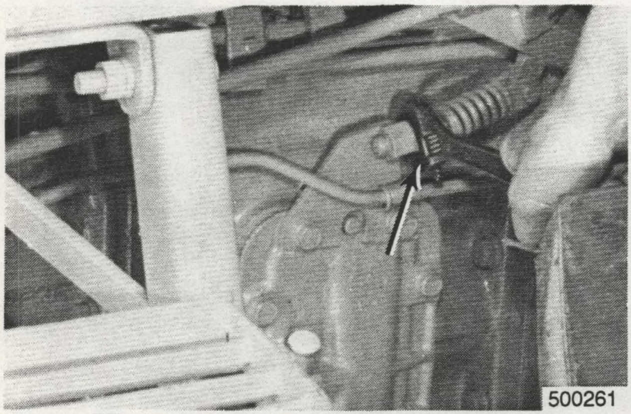


Figure 77: Locknut

4. Loosen the clutch pedal arm return spring adjusting bolt locknut.

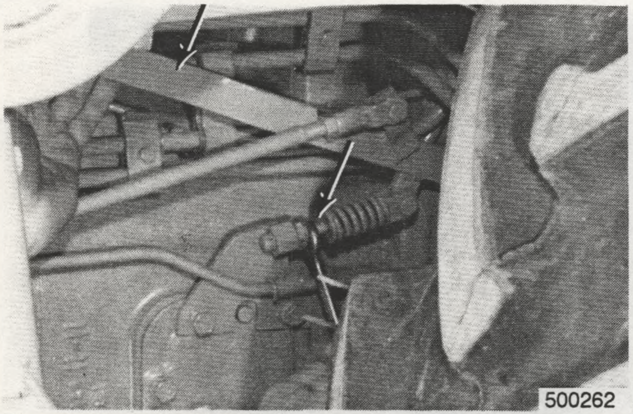


Figure 78: Adjusting Bolt

5. Adjust the return spring adjusting bolt so that when the pedal arm is pulled downward from the floor pan 1.5 to 2 inches (38 to 50 mm) and released, the pedal will return.

NOTE: *Pulling the pedal arm down too far will cause it to go over-center.*

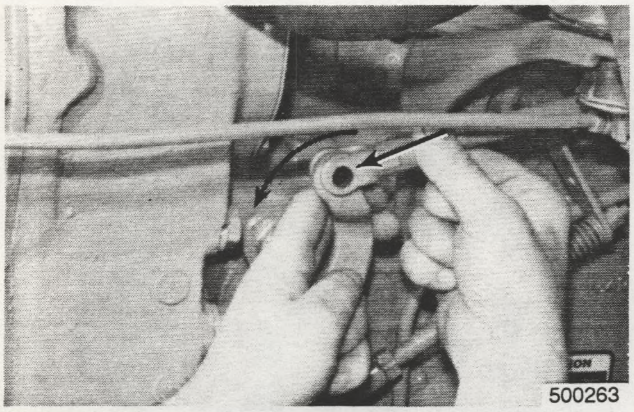


Figure 79: Lower Clevis

6. While holding the clutch bell crank arm fully counterclockwise, adjust the upper rod clevis so that the pin holes align.

7. **From this point, screw the clevis in 5.5 turns on the rod and install the pin and cotter key. Tighten the lock nut.**

8. **Hold the transmission brake lever fully counter-clockwise, adjust the rod clevis so that the pin holes align. From this point, screw the clevis in 5.5 turns and install the pin and cotter key. Tighten the lock nut.**

Clutch Internal Adjustment

Whenever clutch pedal free travel is adjusted, the clearance between the clutch pressure plate release fingers (levers) and the front face of the release bearing should be checked and if required adjusted.

NOTE: ***This check and/or adjustment must be made after the external linkage adjustments have been performed.***

Adjustment Procedure:

1. Remove the clutch housing access hole cover plate located on the bottom of the clutch housing.

2. Use a wrench on the front crankshaft pulley nut to rotate the engine until the clutch pressure plate release lever and adjuster screw is visible and accessible in the access hole. Use a long thickness gauge to measure the distance between the front face of the release bearing and each of the three pressure plate release fingers. This distance must be in the range of 0.125 - 0.165 inch (3 - 4 mm). This clearance must not vary more than 0.003 inch (0.076 mm) between each of the levers.

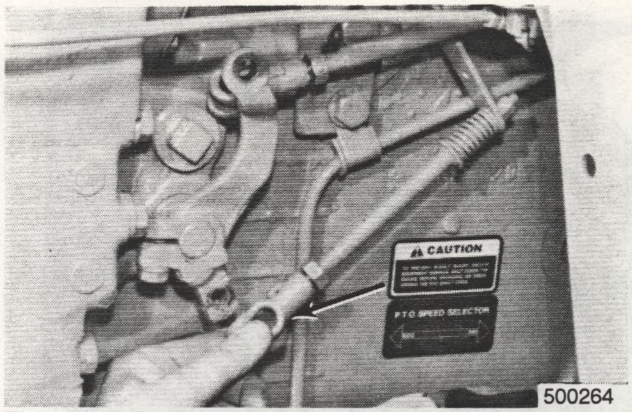


Figure 80: Clevis

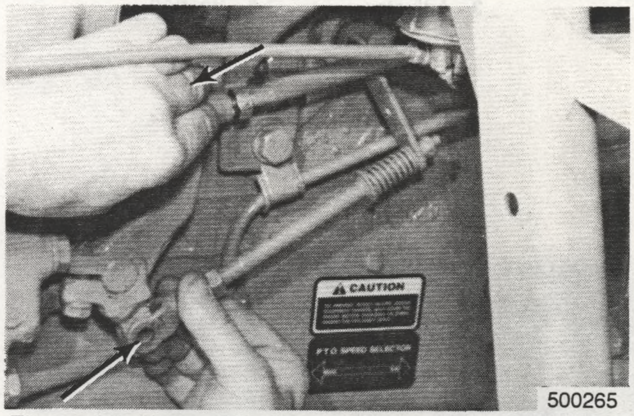


Figure 81: Upper Clevis

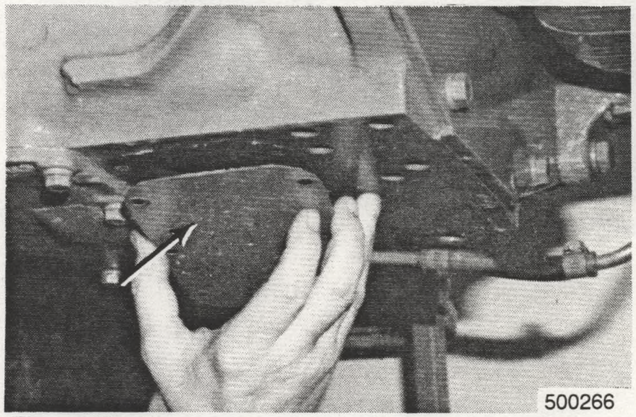


Figure 82: Cover

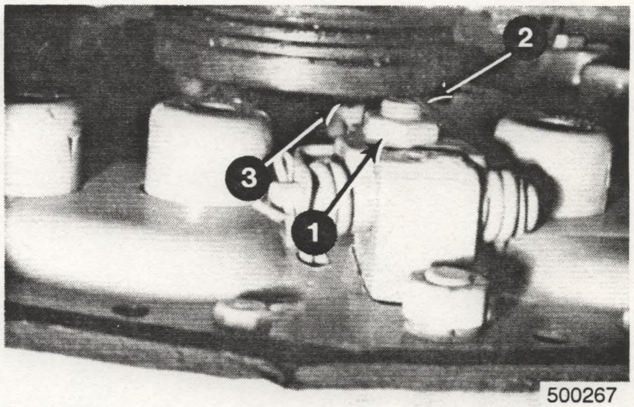


Figure 83:

1 - Locknut 2 - Adjuster Bolt 3 - Lever Clearance

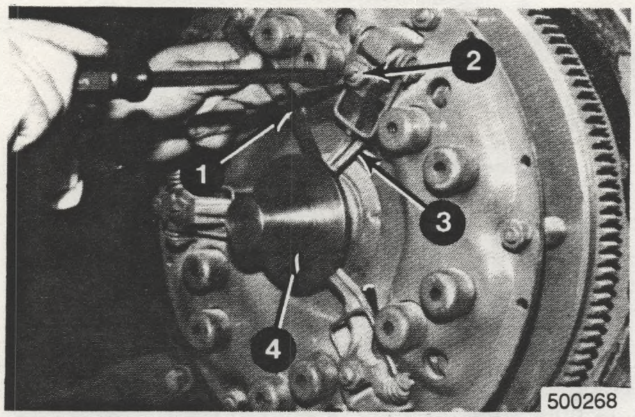


Figure 84: 1 - Feeler Gauge 2 - Adjuster 3 - Lever 4 - Bearing

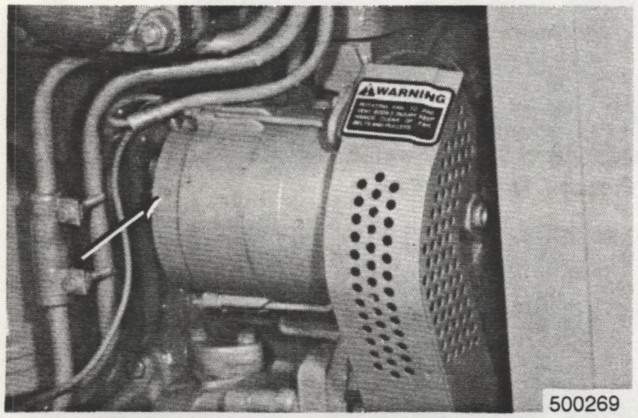


Figure 85: Screen

3. To adjust the clearance, loosen the lever adjusting screw locknut. Turn the adjusting screw in or out as required while using a thickness gauge as shown to adjust the correct clearance on each lever. Tighten the adjusting screw locknut and recheck the clearance.

IMPORTANT: *Adjust each lever equally so that there is no more than 0.003 inch (0.076 mm) difference between the levers.*

NOTE: *The unit shown in photo is a bench mounted unit used for photography demonstration only.*

4. Install the access hole cover plate.

Electrical System

Alternator

The alternator is driven by a belt from the engine crankshaft. Alternator current output is controlled by a transistorized regulator.

No service or adjustment should be attempted on the alternator or regulator with the exception of periodically cleaning the alternator drain holes located on the bottom of the alternator housing and cleaning the screen on the end frame to prevent overheating if working in heavy chaff conditions.

To prevent damage to the alternator, regulator, and wiring harness observe the following rules:

1. **Disconnect** the battery cables before working on the electrical system.
2. **Do not** run the engine with the alternator on an open battery circuit.
3. **Do not** jump or ground the terminals on the alternator or regulator.
4. When using a battery charger or booster battery, **always** connect positive to positive and negative to negative.
5. **Always** disconnect the battery ground cable before doing any electrical welding on the tractor or connected implement. See "Battery Access or Removal" section of this manual.

Charge Rate Seasonal Adjustment

The alternator has provisions to adjust the regulator voltage for summer or winter operation.

The seasonal adjustment screw is located on the rear side of the alternator.

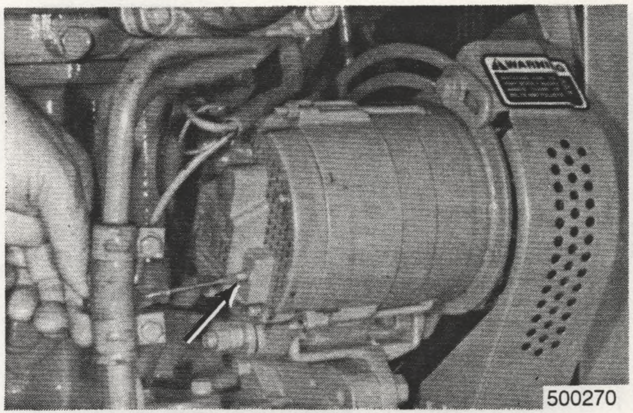


Figure 86: Voltage Adjustment

For winter operation, turn the screw clockwise to position 3 until the screw just bottoms at the end of its thread.

For summer operation, turn the screw counterclockwise until the screw runs out the full length of thread.

IMPORTANT: *Before turning the seasonal adjustment screw be sure the ground lockout switch is off (open).*

NOTE: *If the ammeter indicates rapid fluctuations in the charging rate, check the belt tension and condition. If the drive belt is satisfactory, contact your dealer for service.*

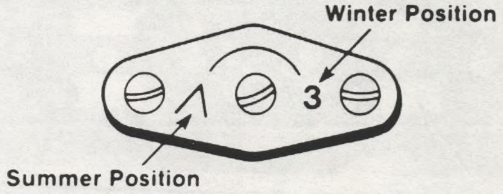


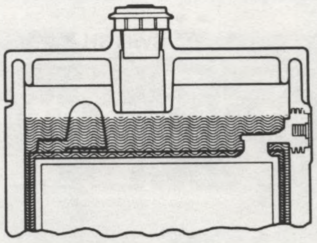
Figure 87:

Batteries

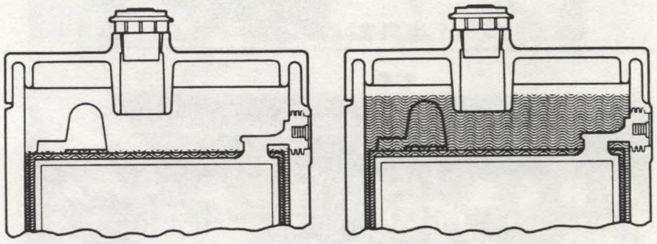
Every 125 hours (or 3 months) check the water level in each cell of the batteries. Water must be added before the top of the separator plates are exposed. Unless the water you use has no minerals, add distilled water to the batteries.

IMPORTANT: *When water is added at ambient temperatures below 32° F (0° C) the batteries must be charged immediately to mix the electrolyte and water to prevent freezing of the water.*

CAUTION: Batteries contain sulfuric acid. Battery acid causes severe burns. Avoid contact with clothing, eyes, or skin. Always wear eye protection when charging, or performing any service on or near batteries. Batteries produce explosive hydrogen gas. Keep sparks, flame, and smoking materials away and provide adequate ventilation when charging or working near batteries.



Correct Level



Low Level *High Level*

Figure 88:

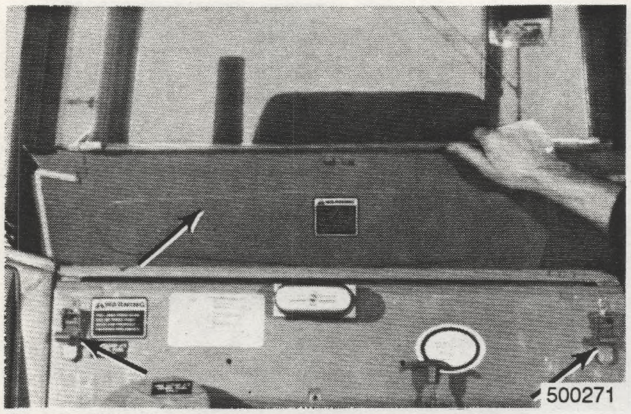


Figure 89: Battery Access Cover

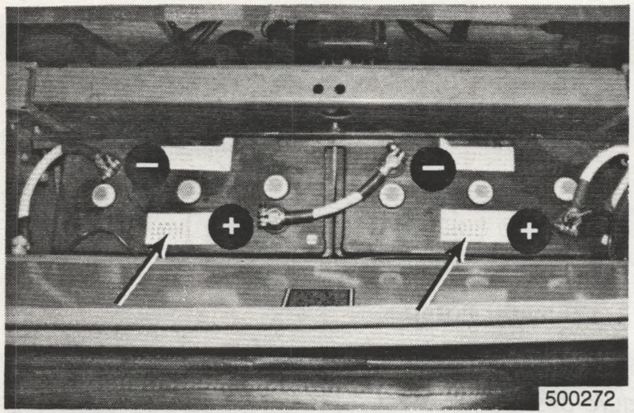


Figure 90: Two 6-Volt Batteries

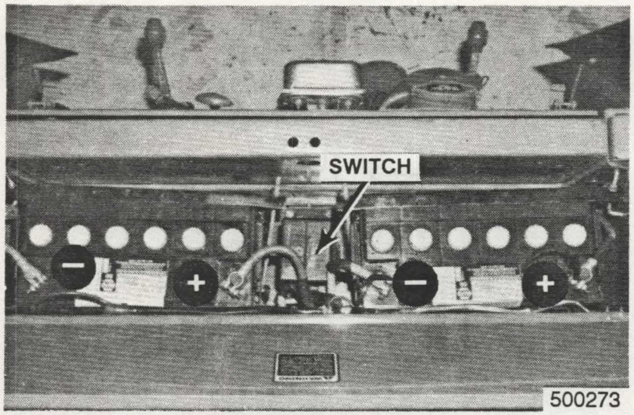


Figure 91: Two 12-Volt Batteries

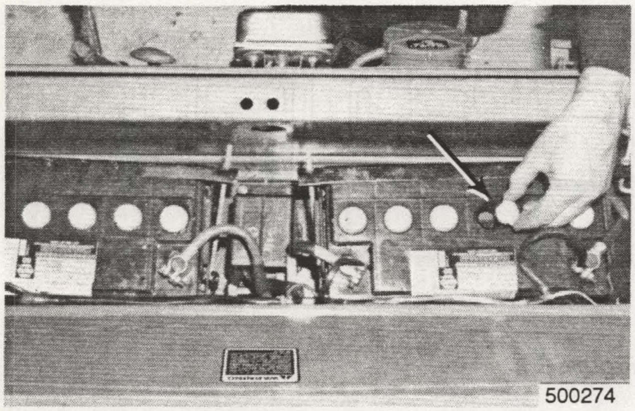


Figure 92: Cell Cap

Battery Service

The batteries are located in a compartment directly behind the operators seat. To access the batteries for service, release the spring latch located at each rear corner of the battery compartment and lift the door.

NOTE: *If your tractor is equipped with a cab, it will be necessary to open the rear window to open the battery compartment door.*

12-Volt Starting Systems

If your tractor is equipped with a 12-volt starting system, there are two 6-volt batteries connected in series located in the battery compartment.

24-Volt Starting System

If your tractor is equipped with a 24-volt starting system and 12-volt electrical system, there will be two 12-volt batteries connected through a series/parallel switch located between the two batteries.

To Check Battery Water Level

Clean all dirt and debris from the top of the batteries. Remove the cell caps to check the water level in each cell as described earlier. Check the vent holes in each cap to be sure they are open.

Periodically check all battery terminal connections to be sure they are clean and tight. To remove corrosion, wash the terminals and cables with a solution of 1 part baking soda and 4 parts water. Rinse all parts and painted surfaces thoroughly with clear water. Keep battery terminals tight and inspect cables for damage. Replace any damaged or worn cables immediately. Put a coating of light grease on the terminals to reduce corrosion.

When it becomes necessary to disconnect battery cables for any reason, always disconnect the negative battery terminal first.

CAUTION; To prevent personal injury or system damage, the negative cable must be disconnected first to prevent the possibility of sparks or burns from accidental arching of the wrench should it contact metal. When installing and/or connecting batteries, always connect the positive terminals first and the negative terminal last. NEVER reverse polarity.

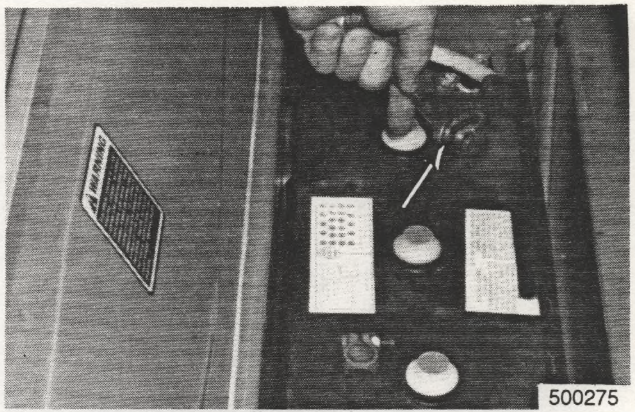


Figure 93: Negative Terminal

Battery Boosting or Charging

CAUTION: Battery explosion and/or damage to the electrical system can result from improper connection of booster batteries or charger. Always connect positive to positive and negative to negative. Keep the electrical system and batteries in good repair so that jump starting or in-chassis charging is not required. Never smoke or allow flame or sparks in the battery area.

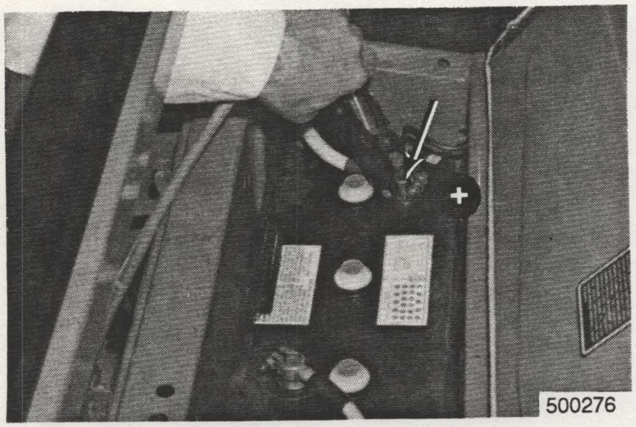


Figure 94: Positive Terminal

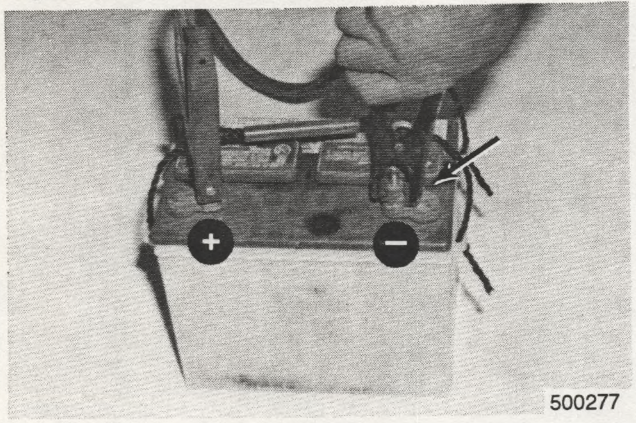


Figure 95: Negative Cable Clamp

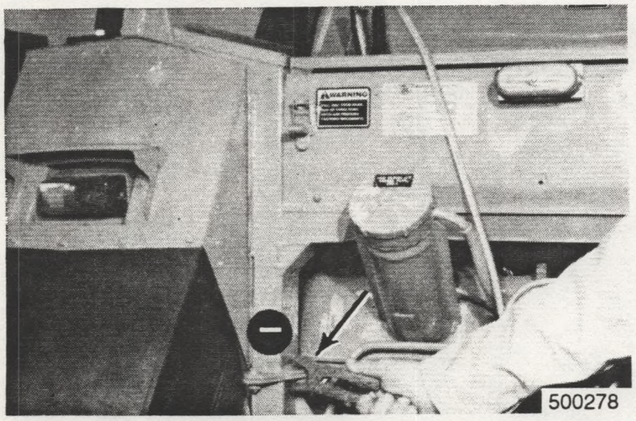


Figure 96: Negative Clamp

Boost Starting Procedure: (12 Volt System Only)

Boost starting is not recommended. However, if boost starting from an auxiliary battery is required in emergency situations, connect a large capacity 12-volt auxiliary battery to the system as follows:

WARNING: Avoid possible injury or death from a runaway machine. Do not start engine by connecting to, or shorting across starter terminals. This bypasses normal starting circuitry and tractor will start in gear. Start the engine only from the operators seat with the transmission in neutral. NEVER start engine while standing on ground.

1. Connect the positive (+) cable clamp of the auxiliary battery to the positive terminal on the tractor left hand 6-volt battery.

IMPORTANT: *The cable clamp must not make contact with any metal on the tractor.*

2. *Connect one of the negative (-) cable clamps to the negative (-) terminal of the auxiliary battery.*

3. *Connect the opposite negative cable clamp to the tractor chassis away from the batteries.*

IMPORTANT: *This is the only safe method of starting the tractor from an external power supply. Start the engine from the operators seat only. Be sure the ground lockout switch is closed when starting.*

After the engine is started, disconnect the auxiliary battery cables in the exact order as follows:

1. Disconnect the negative booster cable clamp from the tractor chassis.
2. Disconnect the opposite negative cable clamp from the auxiliary battery negative terminal.
3. Disconnect the positive booster cable clamp from the positive terminal of the tractor battery and then from the positive terminal of the auxiliary battery.

24-Volt Starting Systems (If equipped)

WARNING: Tractor models equipped with 24-volt starting systems MUST NOT be boost started from a 12-volt auxiliary battery source. Amperage draw can be great enough to cause battery explosion and serious personal injury or death.

Tractors with 24-volt starting system, use two 12-volt batteries connected through a series/parallel switch. If the batteries are discharged they must be tested and individually charged or replaced. **DO NOT ATTEMPT BOOST STARTING.**

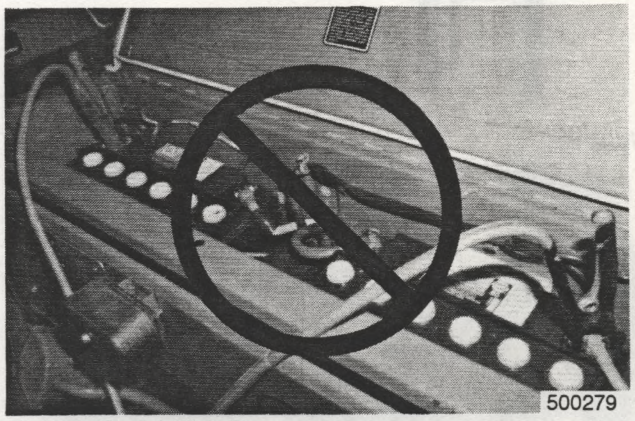


Figure 97: 24-Volt System

Battery Charging Procedure

If the batteries are discharged it is recommended to check each battery cell with a hydrometer. If the battery is good the specific gravity reading of each cell should be the same for a given ambient temperature. A battery cell with a specific gravity reading lower than adjacent cells indicates the battery is bad and should not be charged.

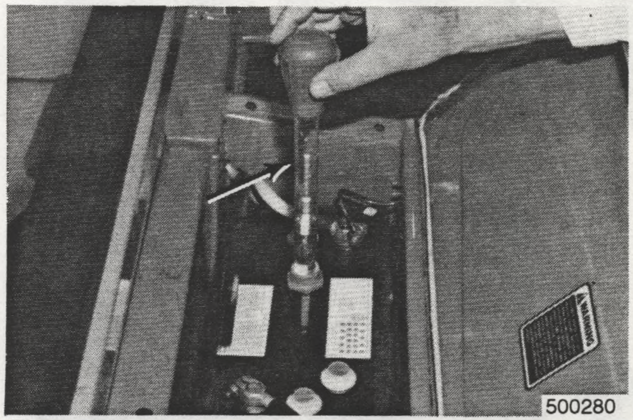


Figure 98: Hydrometer

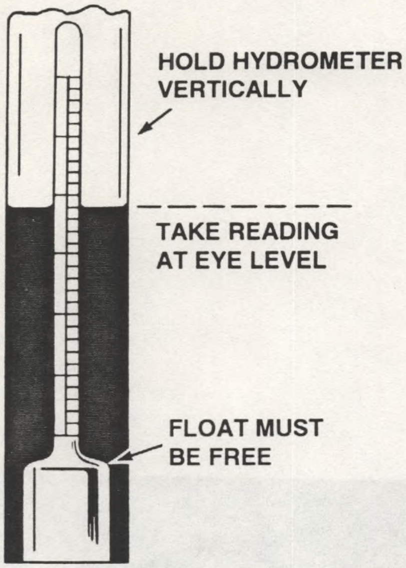


Figure 99:

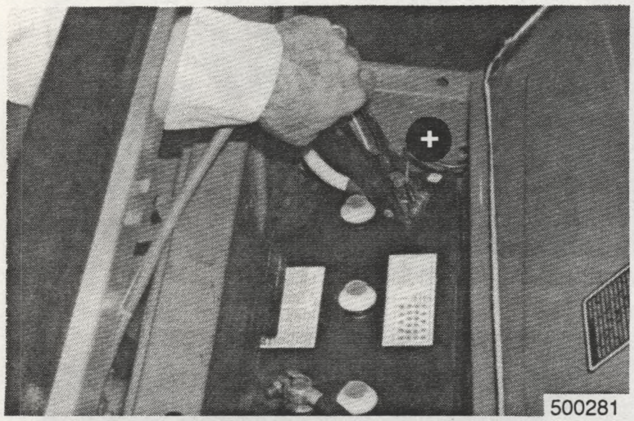


Figure 100: Positive Terminal

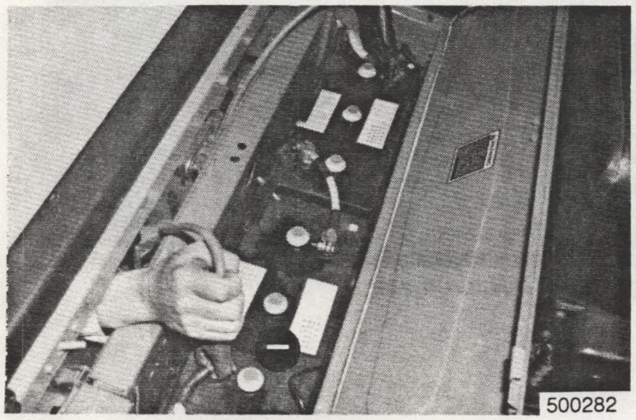


Figure 101: Negative Terminal

A fully charged battery will have a specific gravity reading of 1.250 at 80°F (27°C). **Add** 4 points (.004) to the float reading for each 10°F above 80°F. **Subtract** 4 points (.004) for each 10°F below 80°F.

Percent Charge	**Specific Gravity (80°F)**
100%	1.250
75%	1.215
50%	1.170
25%	1.120
Discharged	1.070

When charging batteries, always connect positive to positive and negative to negative. Charge at the lowest rate possible to reduce gas formations. **Do not** charge a frozen battery, it can explode.

If in-chassis battery charging should be necessary, connect the charger in the exact order as follows:

CAUTION: Be sure the battery charger is turned off before connecting cables. DO NOT attempt to charge frozen batteries.

Charging 12-Volt Starting Systems

1. Connect the positive (+) cable clamp of the charger to the positive terminal of the left side 6-volt battery.
2. Connect the negative (-) cable clamp of the charger to the negative terminal of the right side 6-volt battery.
3. Turn on the charger and charge the batteries at the lowest 12-volt charging rate. To disconnect the charger, shut off the charger and reverse the above procedure exactly.

Charging 24-Volt Starting Systems

If your tractor is equipped with a 24-volt starting system, each 12-volt battery must be charged separately. Be sure to shut off the charger before connecting the cable clamps.

1. Connect the positive (+) cable clamp of the charger to the positive terminal of one battery.

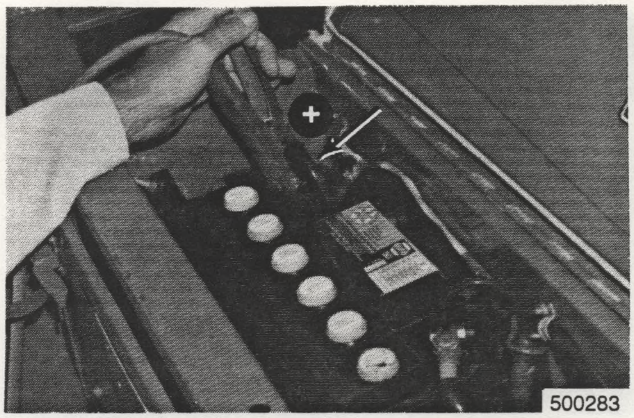


Figure 102: Positive Terminal

2. Connect the negative (-) cable clamp of the charger to the negative terminal of the same battery.

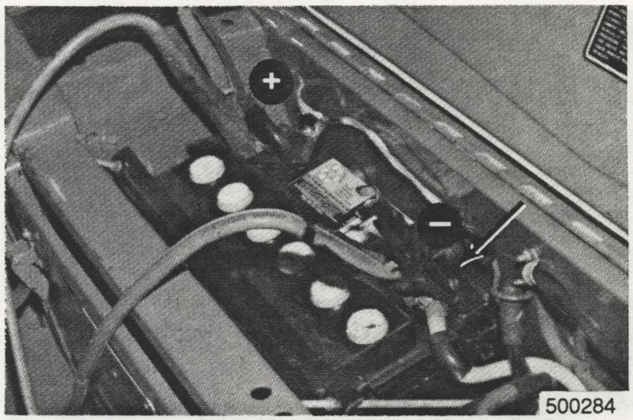


Figure 103: Negative Terminal

3. Turn on the charger and charge the battery at the lowest 12-volt charging rate. To disconnect, shut off the charger and reverse the above procedure exactly.
4. Repeat the above procedure exactly for the opposite 12-volt battery.

Hydraulic System

Checking Hydraulic System Oil Level

Every 125 service hours (or 3 months) open the access cover in the hood. Pull out the hydraulic tank oil level dipstick to check the level of oil in the tank. Oil level should be at or near the upper mark on the dipstick.

IMPORTANT: *Always lower the implement and/or hitch before checking the hydraulic fluid level.*

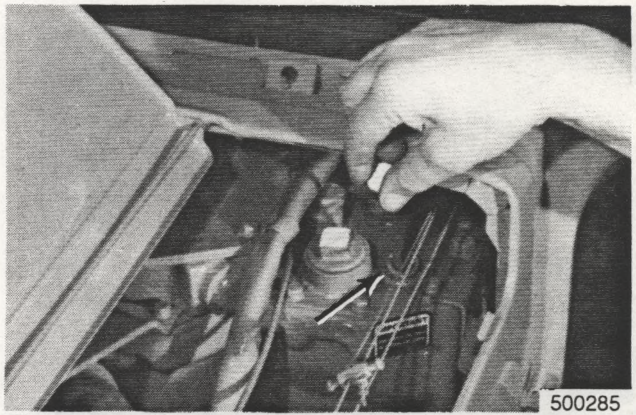


Figure 104: Oil Level Dipstick

If necessary to add hydraulic oil, remove the fill plug on top of the tank. Use only clean oil of the specified type.

Check the vent in the tank, if plugged or dirty, remove the vent, wash in clean solvent and blow dry.

IMPORTANT: *Clean the area around the fill cap and vent before removal.*

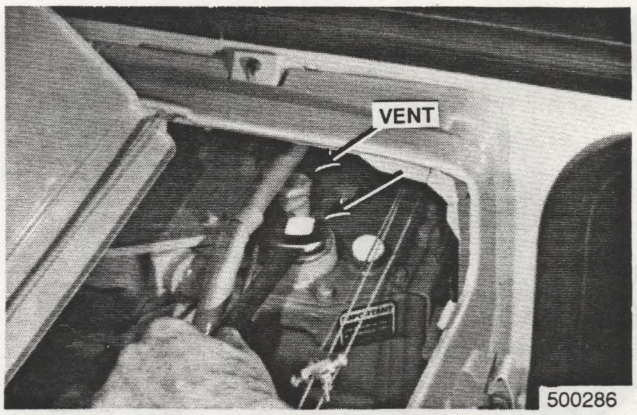


Figure 105: Fill Port Plug

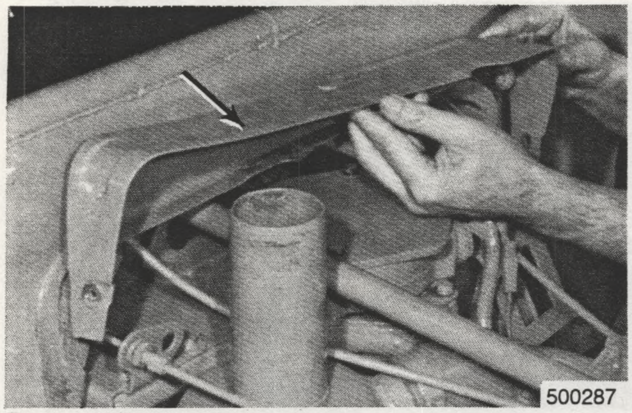


Figure 106: Filler Strip

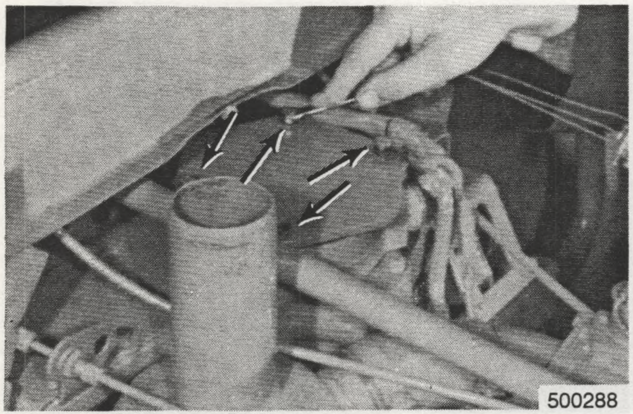


Figure 107: Cover Bolts

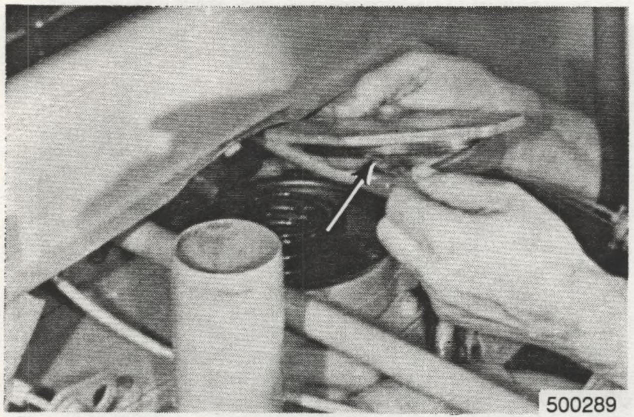


Figure 108: Cover Seal

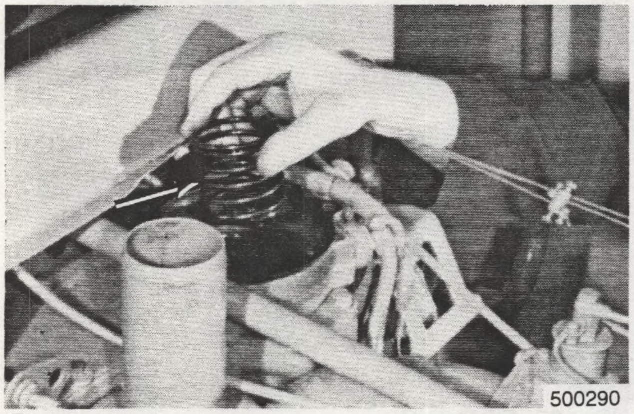


Figure 109: Spring

Hydraulic System Filter

Every 500 service hours (or 6 months) the hydraulic filter element must be removed and replaced with a new filter element.

NOTE: *Place all hydraulic controls in neutral before servicing the filter.*

Filter Removal Procedure:

1. Remove the air system pre-cleaner and open the hood. Remove the hood filler strip.

2. Clean the top of the hydraulic tank of all dirt and debris. Remove the filter cover retaining bolts.

NOTE: *There will be slight spring pressure on the cover.*

3. Remove the cover. Inspect the cover seal for damage. Replace the seal if cracked, stretched or damaged.

4. Remove the compression spring.

5. Remove the compression plate.

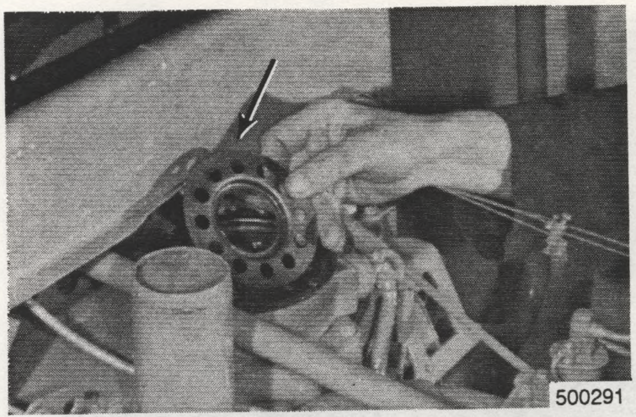


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Figure 110: Plate

6. Lift and remove the filter assembly from the tank.

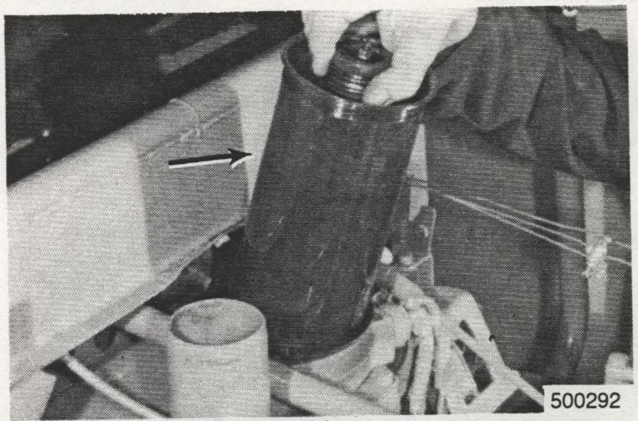

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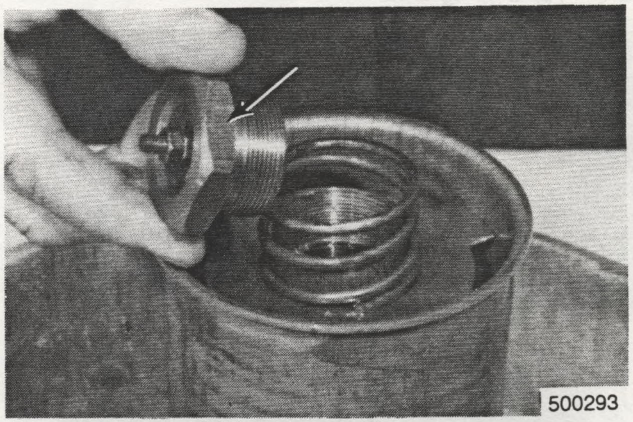
Figure 111: Filter Assembly

7. Remove the filter element retaining nut assembly.

IMPORTANT: *Do not disturb the setting of the by-pass valve adjusting screw nut.*



500293

Figure 112: Nut/Valve Assembly

8. Remove the compression spring.

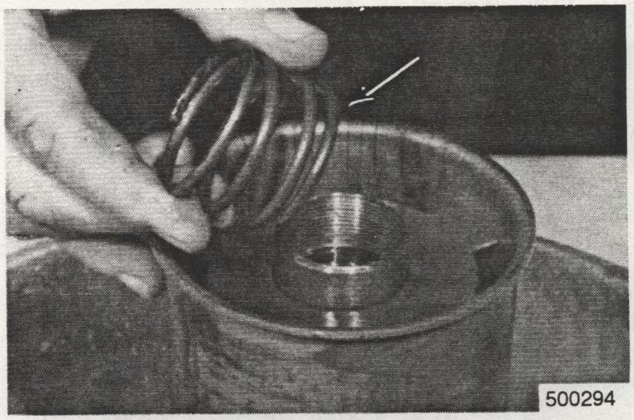


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Figure 113: Spring

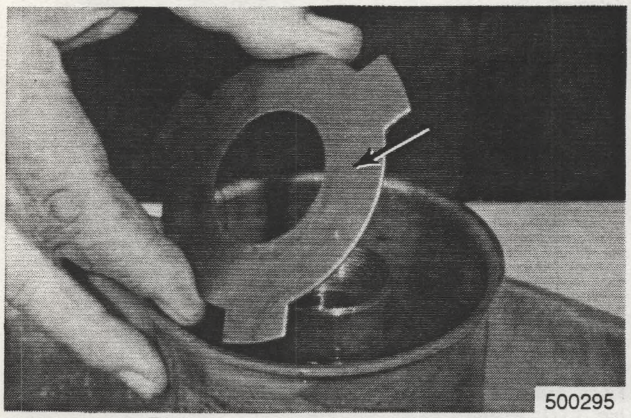

Figure 114: Plate

9. Remove the o-ring compression plate.

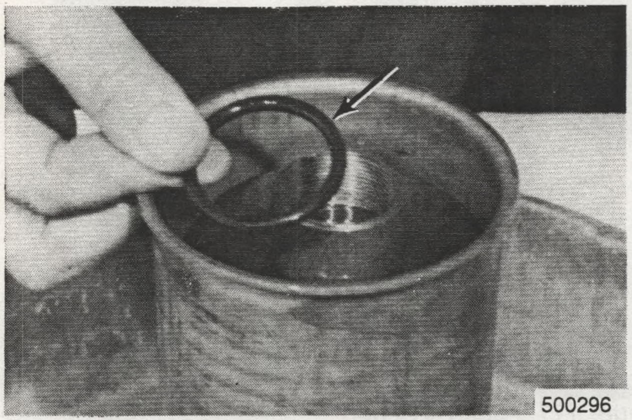

Figure 115: O-Ring Seal

10. Remove the o-ring.

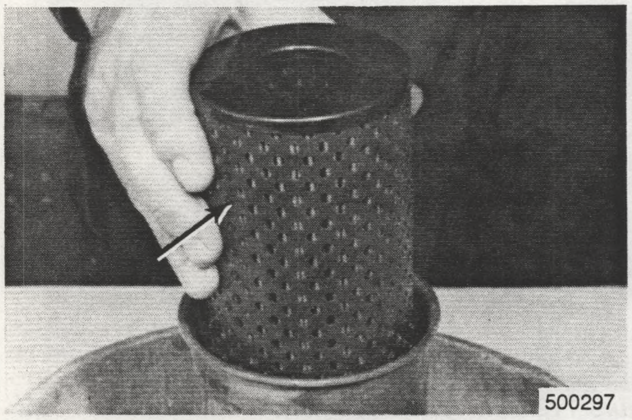

Figure 116: Element

11. Remove the filter element.

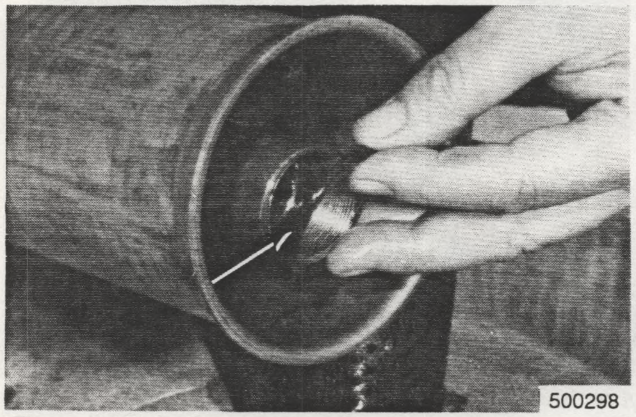

Figure 117: Bottom O-Ring Seal

12. Remove the bottom o-ring from the center tube.

13. Remove the center tube from the cannister. Wash all parts in cleaning solvent and blow dry. Replace any damaged seals.

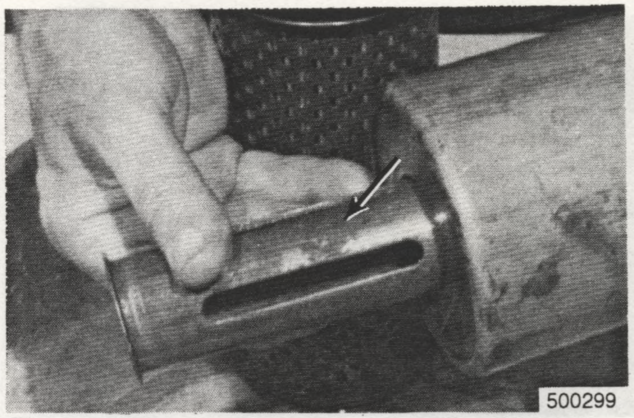

Figure 118: Center Tube

14. Assemble a new filter element in the cannister in the reverse order of disassembly. Tighten the retaining nut hand tight until the spring is fully compressed.

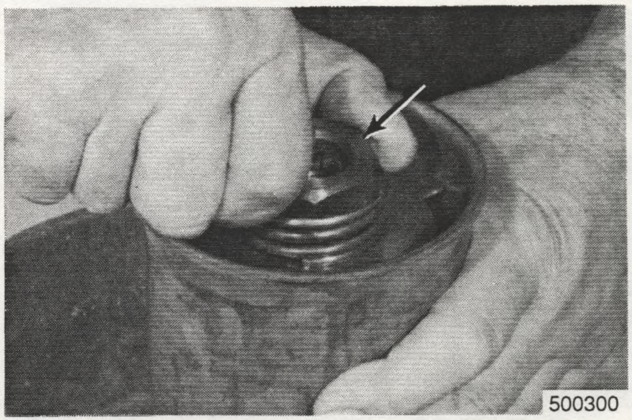

Figure 119: Nut/Valve Assembly

15. Inspect the cannister o-ring in the tank. Replace the o-ring if damaged. Install the cannister assembly into the tank to seat against the seal.

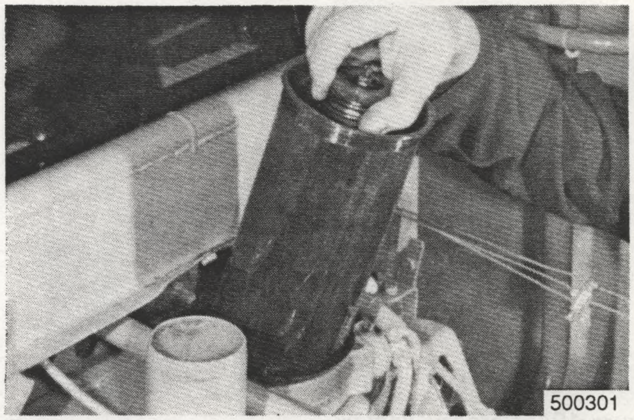

Figure 120: Cannister Assembly

16. Install the compression plate, spring and cover in the reverse order of removal. Fill the hydraulic tank with the specified oil to the full mark on the dipstick.

NOTE: *Install the hood filler strip and precleaner.*

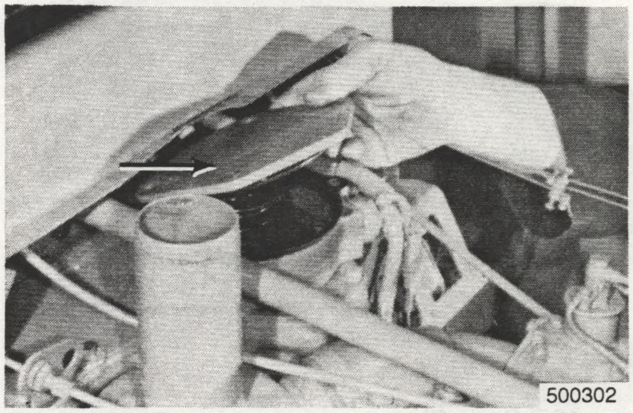

Figure 121: Cover

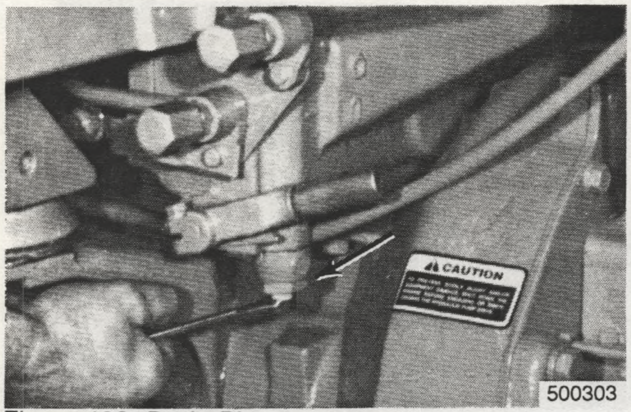

Figure 122: Drain Plug

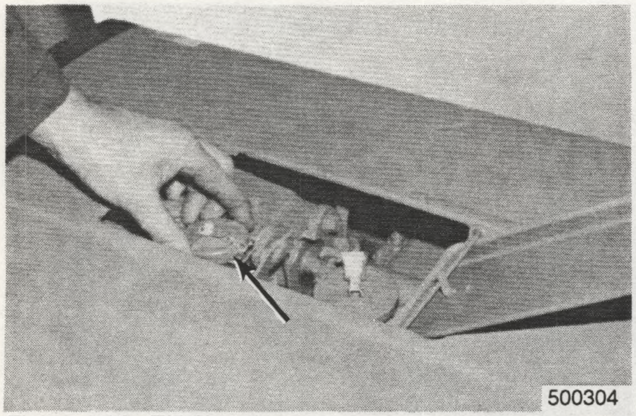

Figure 123: Fill Port Cap

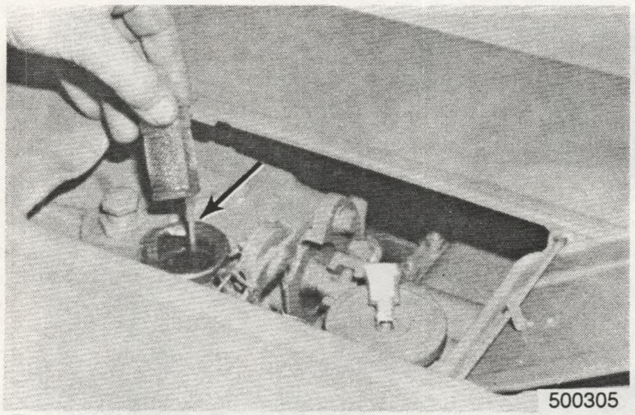

Figure 124: Screen/Dipstick

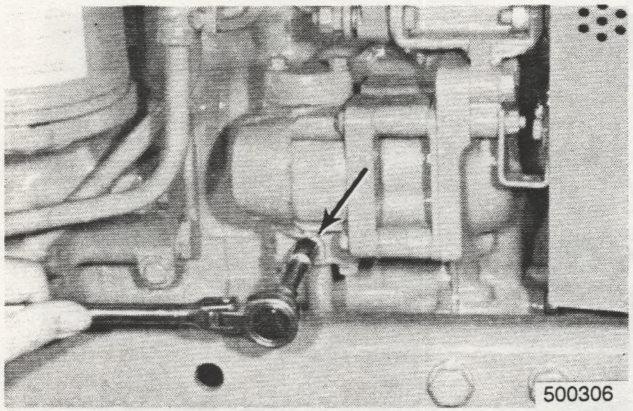

Figure 125: Drain Plug

Hydraulic System Oil Change

Every 1000 service hours (or 12 months) drain and replace the hydraulic oil with new oil of the specified type. For best results drain the oil while it is still warm from operation.

NOTE: *Raise the hitch and collapse all remote cylinders before draining the hydraulic tank.*

Hydraulic Steering System

Checking Steering System Oil Level

Every 125 service hours (or 3 months) open the front access cover on the hood. Clean all dirt and debris from the top of the steering reservoir and remove the fill cap.

Lift out the combination screen and dipstick. The oil level should be at or near the upper mark on the dipstick. If necessary, add hydraulic oil of the specified type to the correct level. Check and if necessary remove and clean the vent.

Steering system Oil Change and Filter Cleaning

Every 1000 service hours (or 12 months) drain and replace the steering system oil with new hydraulic oil of the specified type and clean the filter. Clean the vent and fill screen.

Procedure:

1. To drain the hydraulic steering reservoir, remove the plug located at the bottom of the steering pump. Replace the plug after the oil has drained.

2. Open the hood and clean all dirt and debris from the top of the steering servo. Disconnect the oil supply line from the valve.

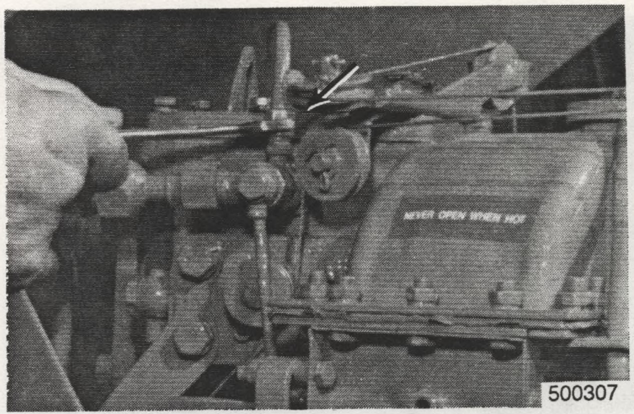

Figure 126: Supply Line

3. Remove the servo cover retaining bolts.

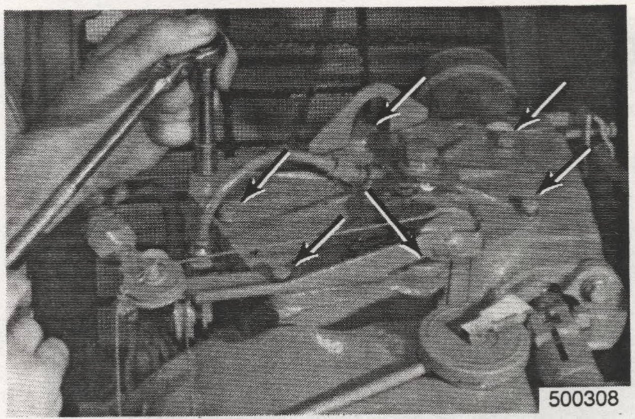

Figure 127: Cover Bolts

4. Install two of the longer retaining bolts from the cover into the two threaded holes of the cover. Screw the bolts in alternately and evenly to push the cover assembly free of the dowel pins.

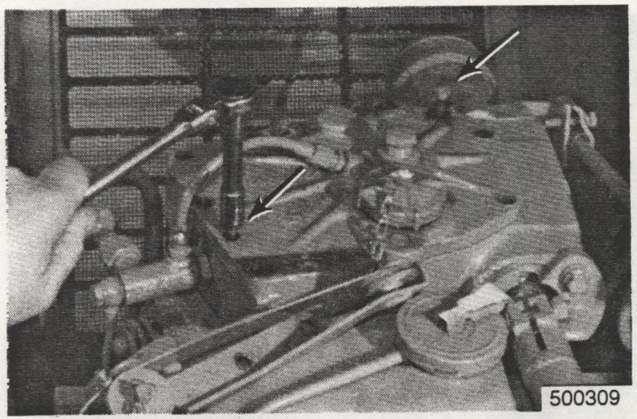

Figure 128: Forcing Bolts

5. Remove the cover assembly. Remove the two forcing bolts from the cover.

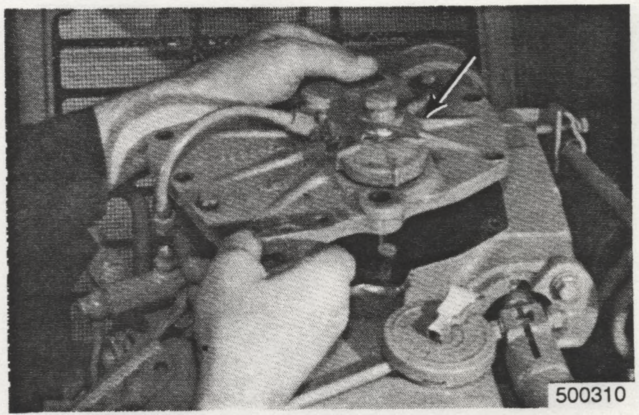

Figure 129: Cover Assembly

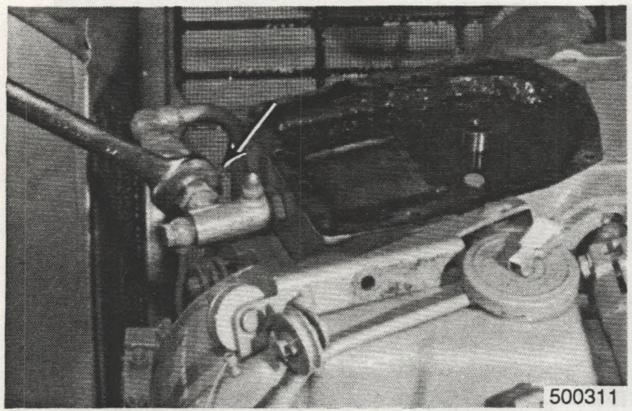

Figure 130: Suction Tube Connector

6. Disconnect the suction line from the valve.

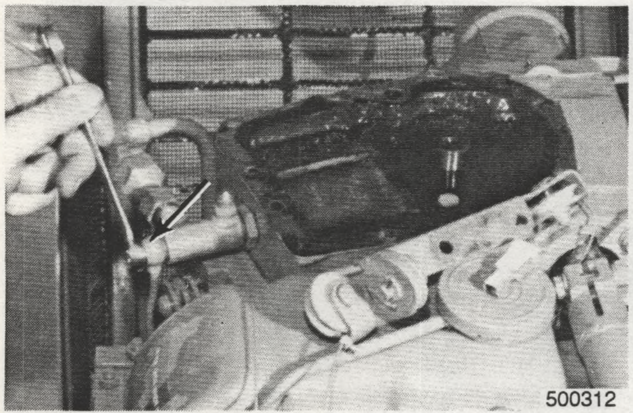

Figure 131: Pressure Line Bolt

7. Disconnect the pressure line from the valve. Be careful not to lose the seal washers.

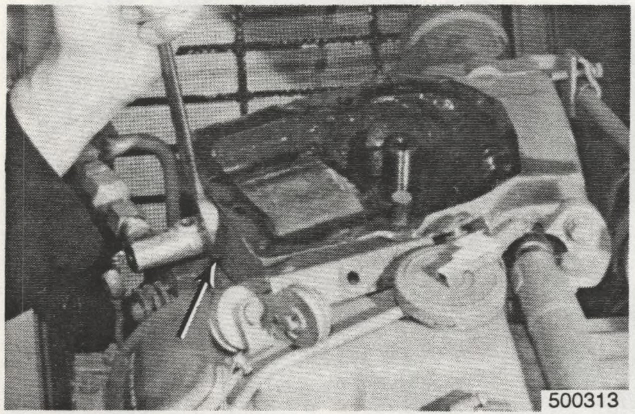

Figure 132: Lock Nut

8. Loosen the valve locknut.

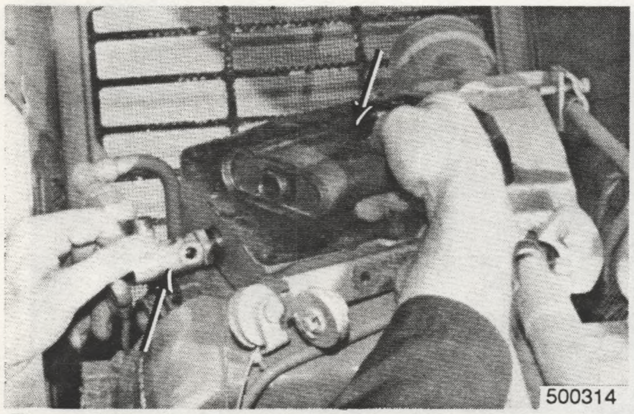

Figure 133: Valve and Screen

9. Screw the valve out of the filter screen. Wash the screen and all parts in cleaning solvent and blow dry. Clean the vent and fill screen.

10. Install the screen, valve and cover in the reverse order of removal. Inspect and if necessary replace the servo cover gasket.

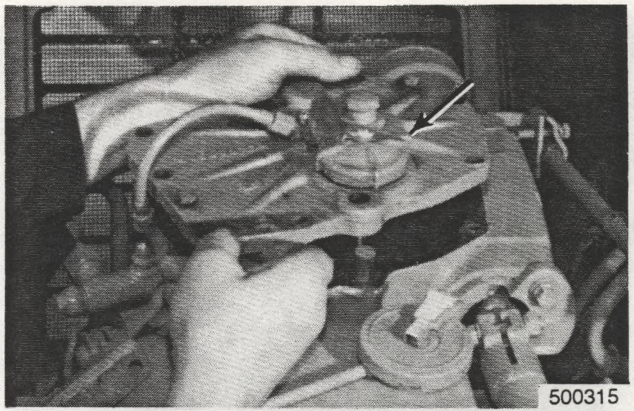
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Figure 134: Cover Assembly

11. Fill the servo tank to the correct level with new hydraulic oil of the specified type.

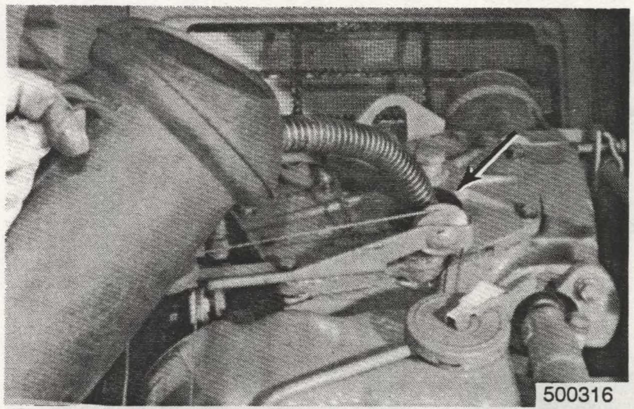
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Figure 135: Fill Port

Steering Shaft U-Joint Lubrication (If Equipped)

If your tractor is equipped with a front mounted steering control unit, grease the steering control shaft u-joints every 125 service hours (or 3 months). Inject 2 - 3 shots (pumps) of grease into the grease fitting of the joint.

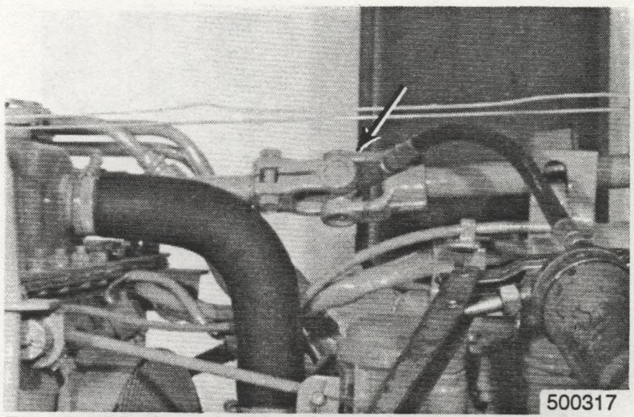
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Figure 136: Steering Shaft U-Joint

Steering Column Lubrication

Every 125 service hours (or 3 months) lubricate the steering wheel telescoping linkage.

Loosen and remove the telescoping locking knob from the center of the steering wheel.

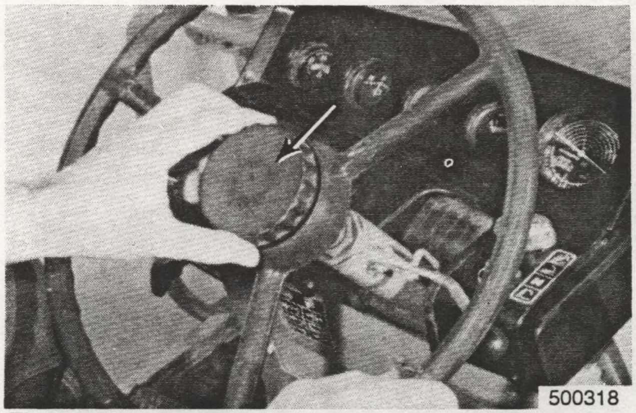
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Figure 137: Lock Knob

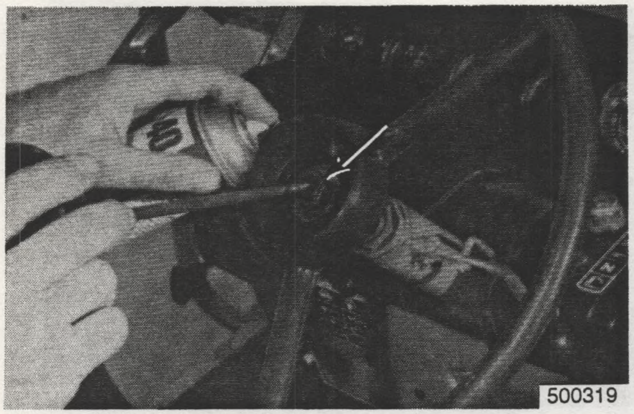


Figure 138: Adjuster Bolt

Use WD40 or equivalent lubricant to lubricate the adjuster bolt threads. Also spray WD40 liberally down through the shaft and sliding mechanism of the column.

Transmission/Differential Lubrication

Every 500 service hours (or 6 months) check the transmission/differential oil level.

Every 1000 service hours (or 12 months) drain and replace the oil with new oil of the specified type.

Checking the Transmission Oil Level

Park the tractor on a level surface. Shutdown the engine and apply the park brake.

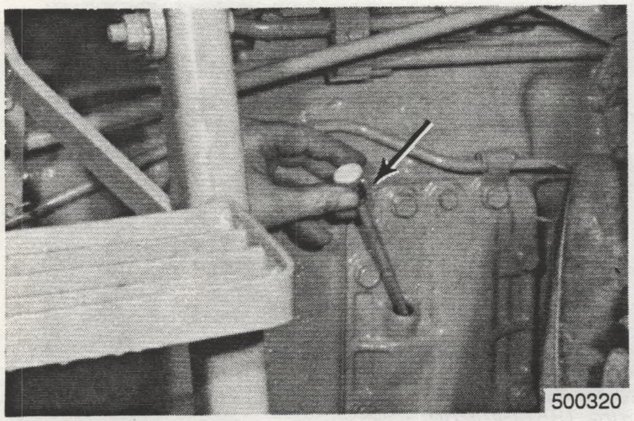


Figure 139: Dipstick

Remove the oil level dipstick located on the left side of the transmission/differential housing. The oil level must be at or near the upper mark on the dipstick.

NOTE: *Be sure the dipstick is inserted all the way when installing.*

Transmission/Differential Fill Port

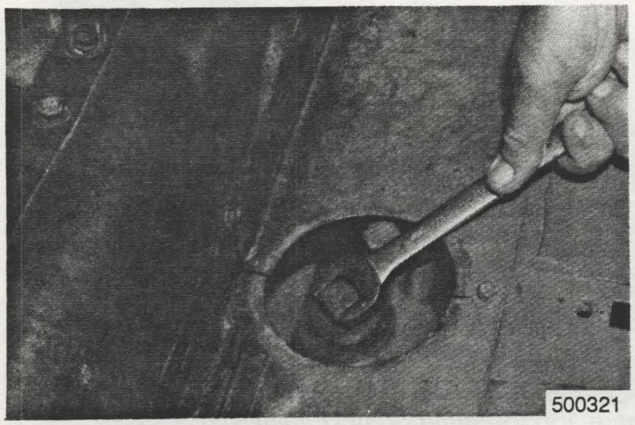


Figure 140: Fill Plug

To add transmission oil or fill the transmission-/differential with new oil, lift the floor mat and remove the cover plate to expose the fill port plug. Clean the area around the plug before removing the plug.

Transmission/Differential Drain

To drain the transmission and differential, two drain plugs must be removed. Always drain the oil while it is still warm from operation. Clean the drain plugs of all debris before installing the plugs.

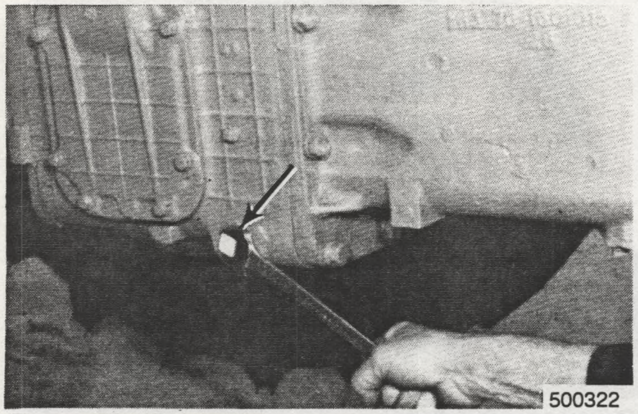


Figure 141: Drain Plug

Remove the plug located on the lower right side of the transmission housing. Install the plug after the oil has drained.

Remove the plug located in the bottom of the differential housing. Install the plug after the oil has drained.

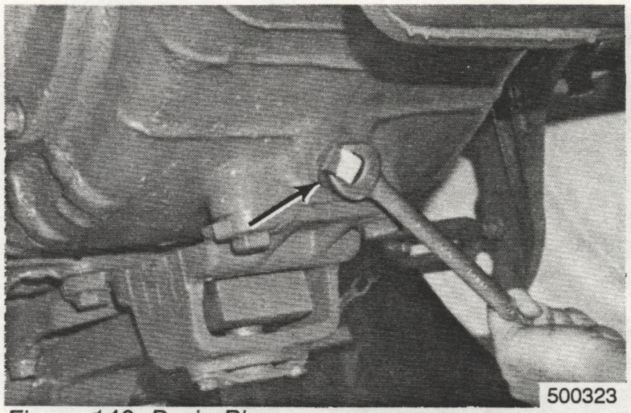


Figure 142: Drain Plug

Transmission/Differential Vent

Every 500 service hours (or 6 months) or more often in severe conditions, remove and clean the transmission vent. Be sure to clean all debris from around the vent before removal.

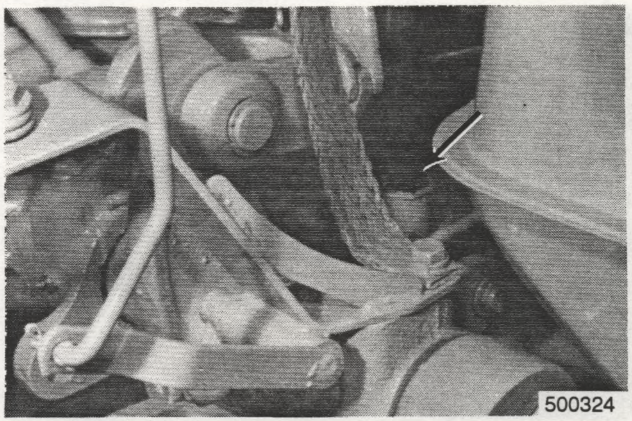


Figure 143: Vent

Mechanical Front Drive (MFD) Axle Lubrication

Every 500 service hours (or 6 months) check the front axle final drives and differential oil levels. Every 1000 service hours (or 12 months) drain and replace the oil with new oil of the specified type.

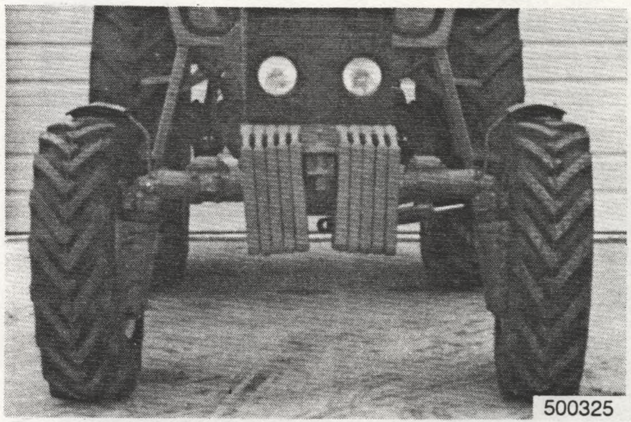


Figure 144: MFD Front Axle

Checking the Front Differential Oil Level

Remove the check/fill plug located on the front side of the differential housing. The oil level must be at or near the lower level of the hole. If necessary, add oil to the lower level of the hole.

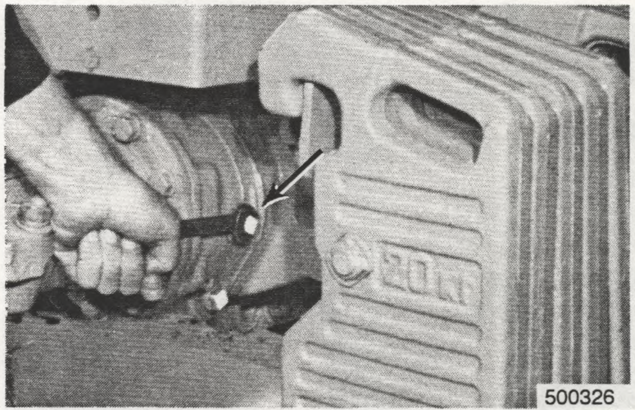


Figure 145: Check/Fill Plug

To drain the front differential housing, remove the drain plug located at the front bottom of the housing. For best results drain the oil while still warm from operation. After draining, clean and install the drain plug. Fill the housing with new oil to the correct level.

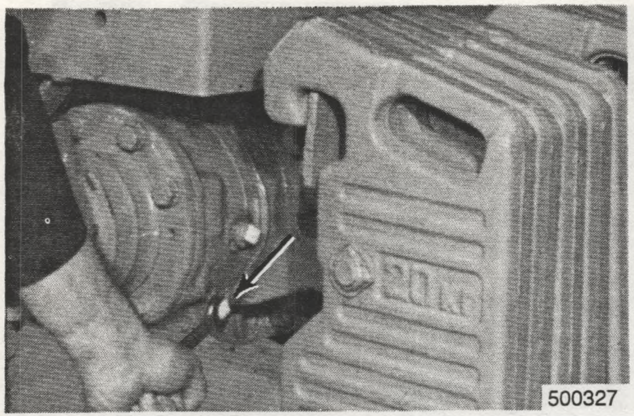


Figure 146: Drain Plug

Upper Bevel Gear Oil Level Check

Every 500 service hours (or 6 months) remove the check/fill plug located on the left and right side upper bevel gear housing. Oil level should be at or near the lower level of the plug hole.

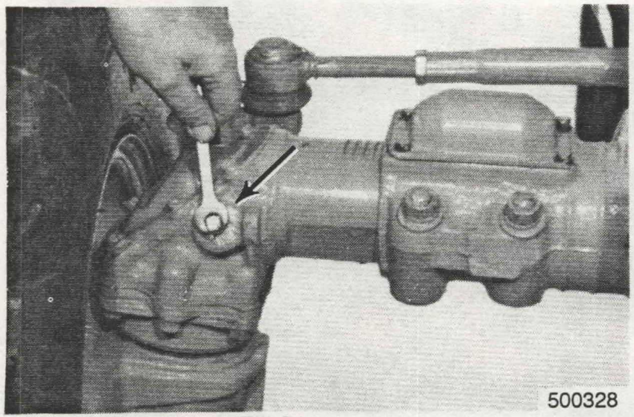


Figure 147: Check/Fill Plug

Every 1000 service hours (or 12 months) remove and replace the oil in the upper bevel gear housings. Use a suction type gun to remove as much of the old oil as possible.

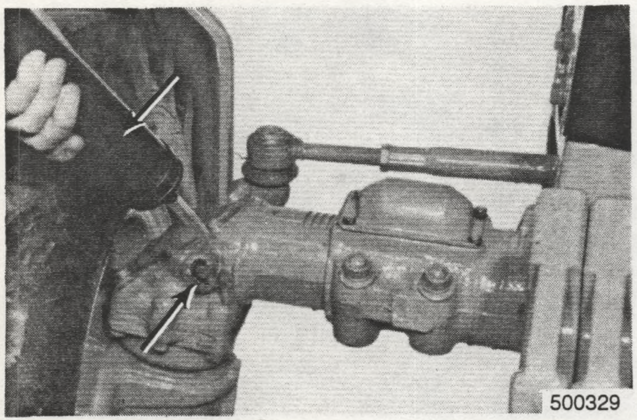


Figure 148: Suction Gun

Every 500 service hours (or 6 months) check the oil level in the left and right side front wheel final drives. Remove the check/fill plug. The oil level must be at or near the lower level of the plug hole.

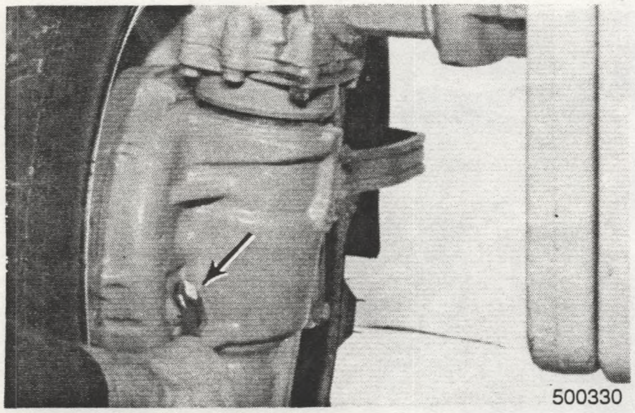


Figure 149: Check/Fill Plug

Every 1000 service hours (or 12 months) drain and replace the oil in the front wheel final drives with new oil of the specified type. To drain the final drives, remove the plug located on the bottom of the housing. After draining, clean and install the plug.

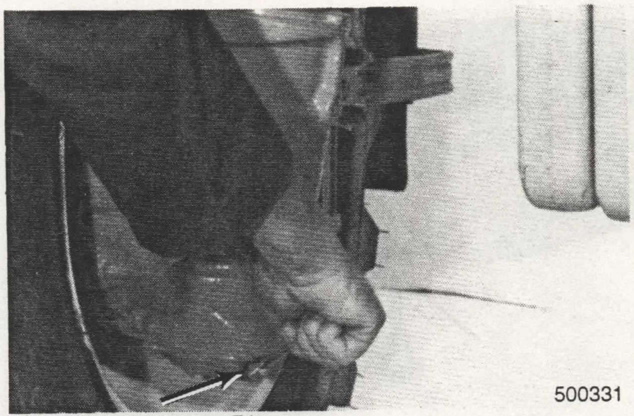


Figure 150: Drain Plug

Front Driveshaft Intermediate Support

Every 500 service hours (or 6 months) check the oil level in the intermediate support bearing housing. To check the oil level, remove the check/fill plug on the side of the housing. Oil level must be at or near the lower level of the plug hole.

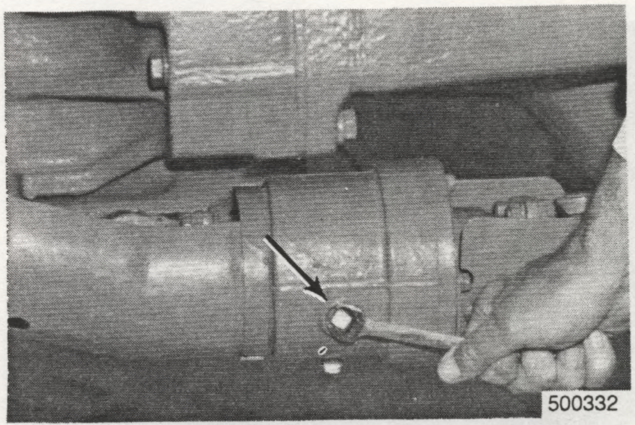


Figure 151: Check/Fill Plug

Every 1000 service hours (or 12 months) drain and replace the oil in the intermediate bearing support housing with new oil. To drain the housing, remove the plug located on the bottom of the housing. Clean and replace the plug after the oil has drained. Fill the housing with new oil of the specified type to the lower level of the check/fill plug hole.

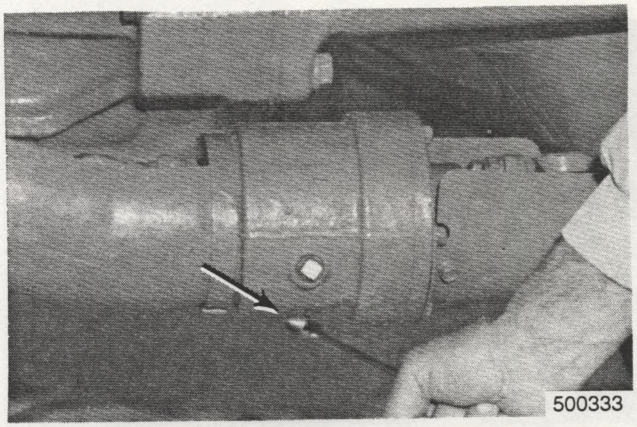


Figure 152: Drain Plug

Every 125 service hours (or 3 months) lubricate the front axle steering cylinder pivot pin pressure grease fittings. Lubricate other steering linkage grease fittings as required.

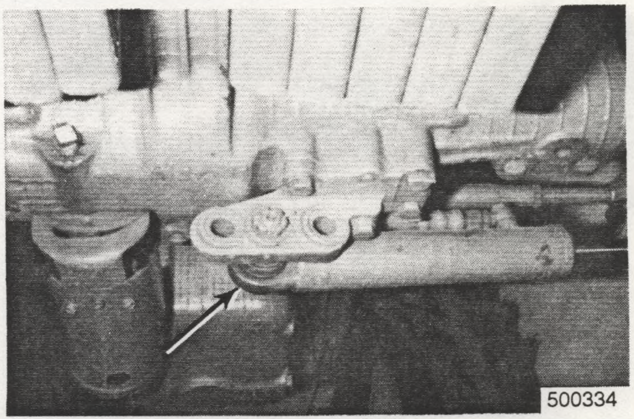


Figure 153: Cylinder Grease Fittings

Intermediate Support Bearing Flange Nut Torque (MFD Models)

After the first 60 hours of operation, and as needed thereafter, the rear flange nut of the intermediate support bearing must be torqued. This must be done so that the free-wheeling clutch within the housing performs correctly.

Procedure:

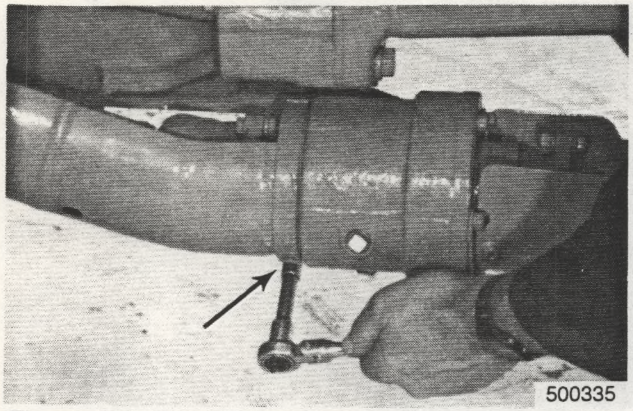


Figure 154: Shield Clamp

1. Loosen the driveshaft shield front clamp retaining bolt.

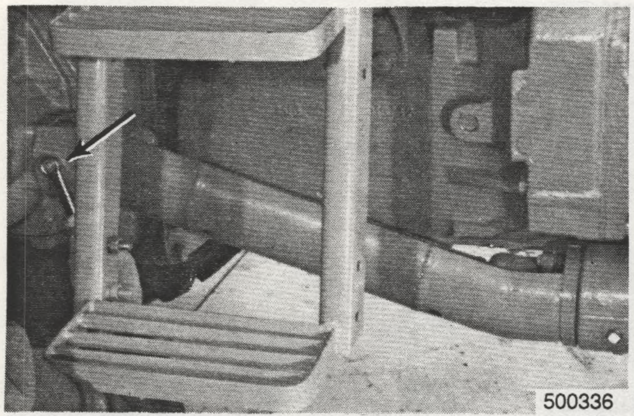


Figure 155: Retaining Bolt

2. Remove the rear shield retaining bolt.

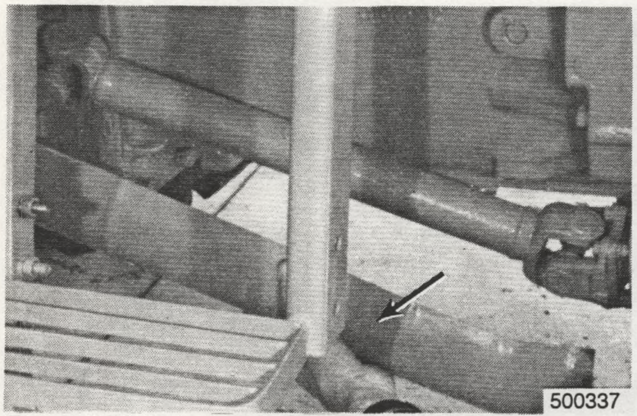


Figure 156: Driveshaft Shield

3. Remove the shield.

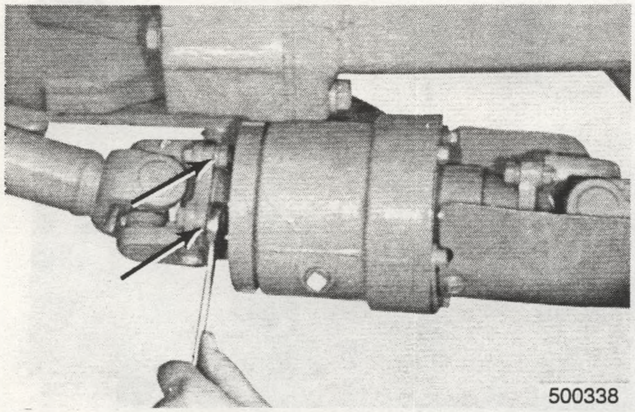


Figure 157: Flange Bolts

4. Remove the four U-joint to flange retaining bolt nuts. Remove the bolts and disconnect the shaft.

NOTE: *It may be necessary to jack one front wheel clear of the ground so that the shaft can be rotated to remove the bolts.*

5. Torque the flange retaining nut to 57 lb ft (77 Nm).

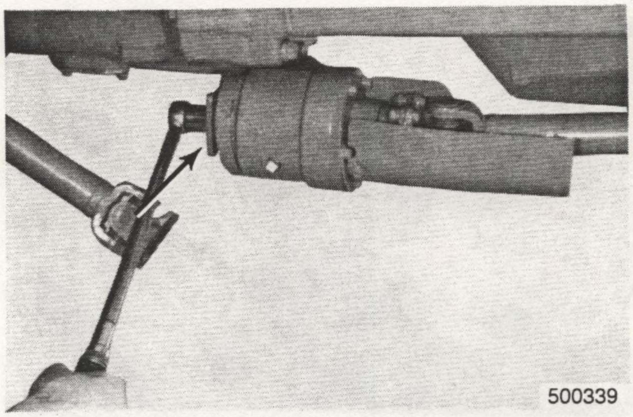


Figure 158: Flange Nut

6. Connect the shaft and install the shield in the reverse order of removal.

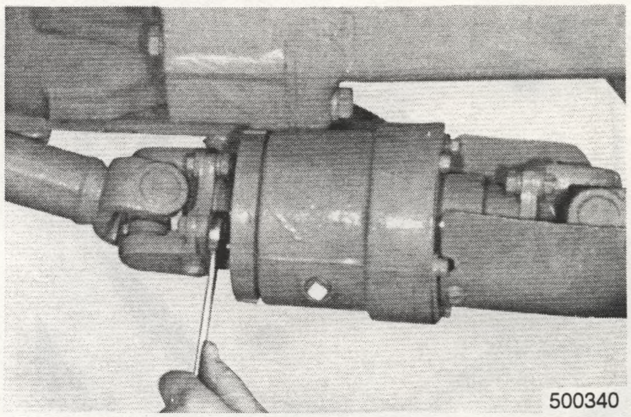


Figure 159:

Front Axle Lubrication (2WD Models)

Every 125 service hours (or 3 months) lubricate the pressure grease fittings for the front axle king pins and steering linkage.

Inject 10 - 12 shots (pumps) of No. 2 Multi-Purpose Lithium grease into each king pin grease fitting.

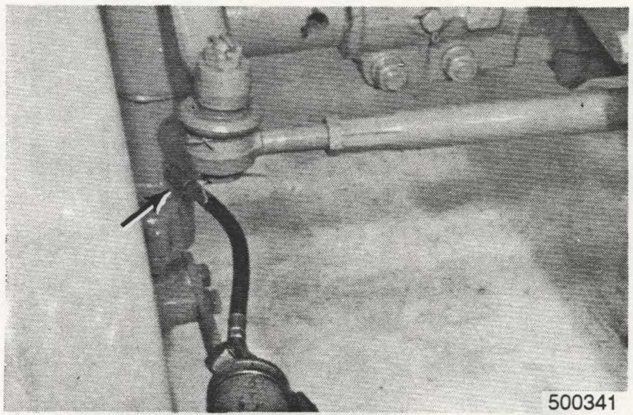


Figure 160: King Pin Grease Fitting

Lubricate the pressure grease fittings for the power steering cylinder pivot pins.

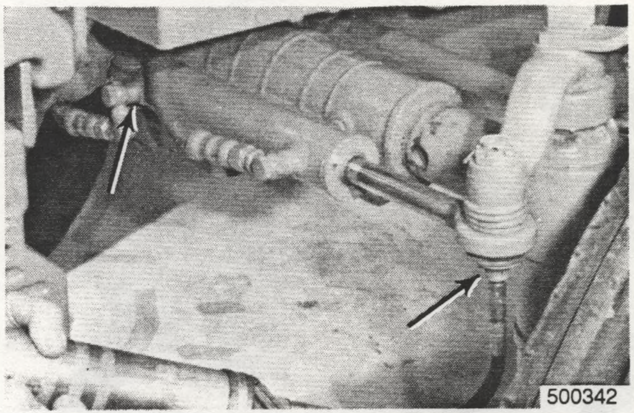


Figure 161: Cylinder Pin Grease Fitting

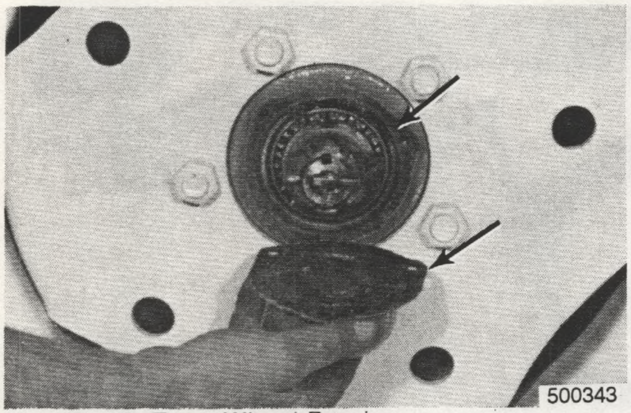


Figure 162: Front Wheel Bearing

Front Wheel Bearing Hubs (2WD Models)

Every 500 service hours (or 6 months) remove the front wheel hub bearing cover. Check the front wheel bearing end play and condition. If necessary, remove the spindle nut cotter key and adjust the bearings to zero clearance.

Every 1000 service hours (or 12 months) remove the wheel hub, inspect and/or repack bearings and replace the hub seals.

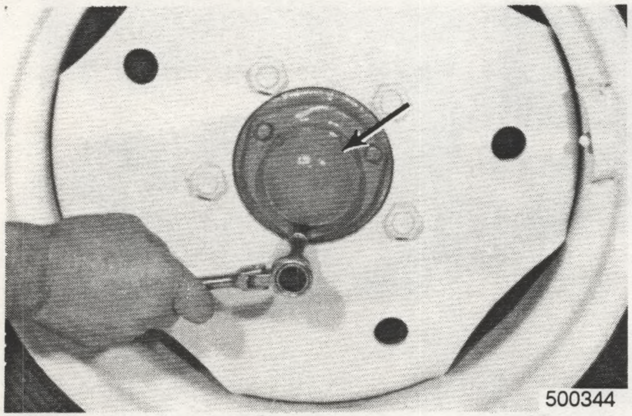


Figure 163: Bearing Cover

Fill the hub cover with grease before installing the cover.

Three Point Hitch Lubrication

Every 125 service hours (or 3 months) lubricate the pressure grease fittings for the 3-Point hitch rockshaft. Use No. 2 Multi-Purpose Lithium grease.

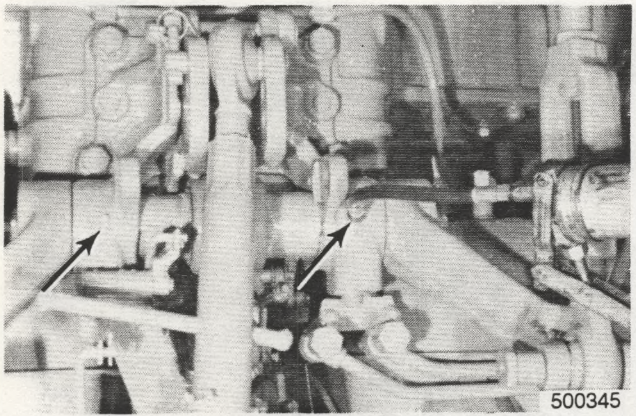


Figure 164: Rockshaft Grease Fitting

At the same interval, grease the right side lift link adjusting gear box. Inject grease until resistance is felt on the hand grease gun.

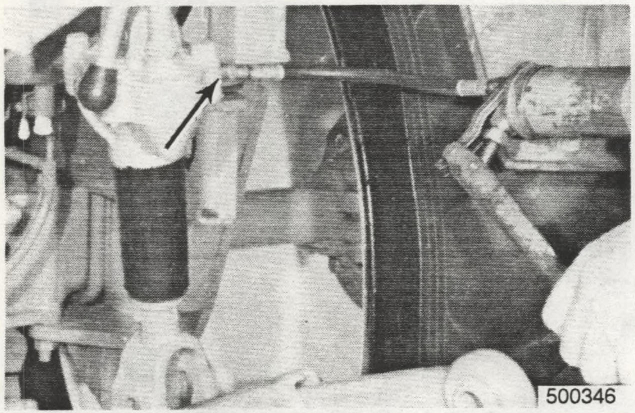


Figure 165: Lift Link Grease Fitting

Air Conditioner System (If equipped)

If your tractor is equipped with an optional air conditioner system, the filter screen should be serviced daily when the air conditioner is used.

Procedure:

1. Release and remove the filter grille.

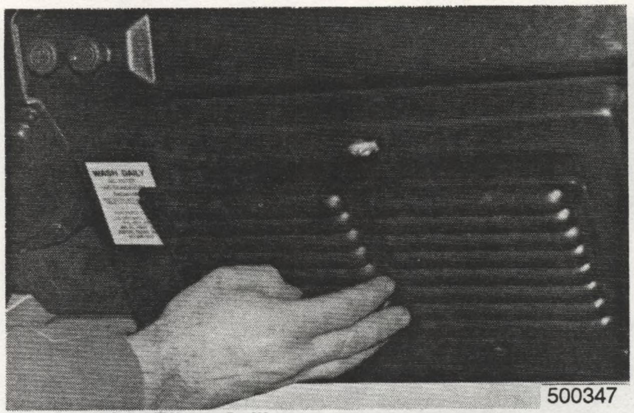


Figure 166: Filter Grille

2. Remove the mesh filter screen, wash the screen in mild detergent and water. Use compressed air to dry. Reinstall the filter and grille cover.

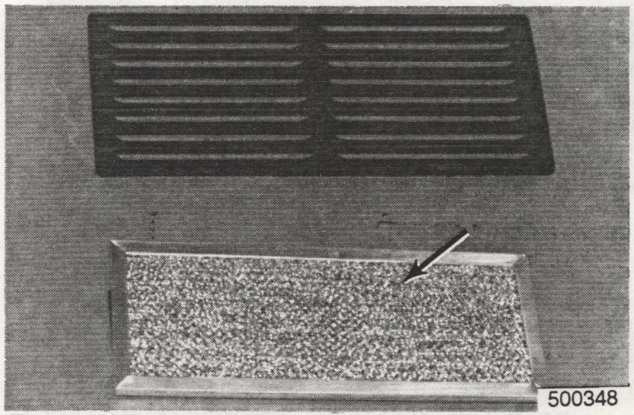


Figure 167: Screen Filter

Air Conditioner Condenser (If equipped)

Periodically, remove the grille from the engine hood. Inspect and if necessary clean the condenser fins of debris. Use high pressure water or compressed air for cleaning.

To check the level of refrigerant in the Air Conditioner System, turn on the air conditioner system and run the engine at 1000 - 1200 rpm. After the system has operated 10 - 15 minutes to stabilize, check the sight glass in the receiver/drier. The sight glass should appear clear with no bubbles or frothing. If the sight glass is full of bubbles or frothing, contact your Belarus dealer for service.

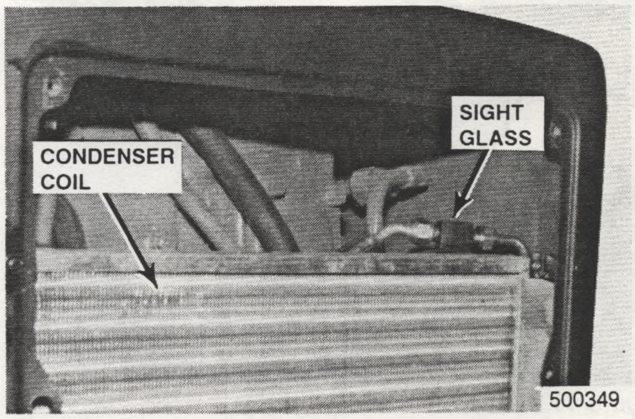


Figure 168:

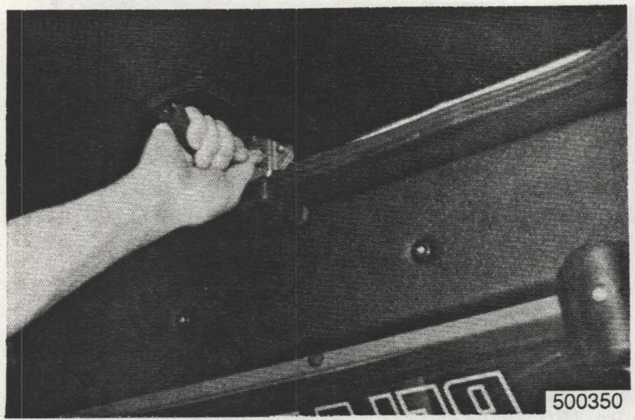


Figure 169: Roof Latch

Cab Air Filter Service (If equipped)

The cab ventilation filter should be removed and cleaned daily in adverse conditions.

To remove and clean the filter:

1. Release and open the cab top.

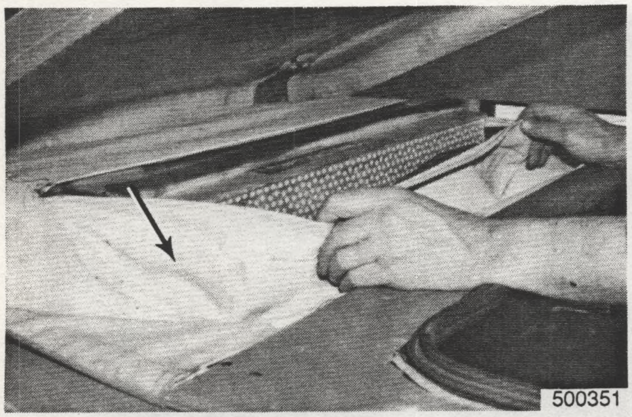


Figure 170: Curtain Cover

2. Fold back the curtain to expose the filter element.

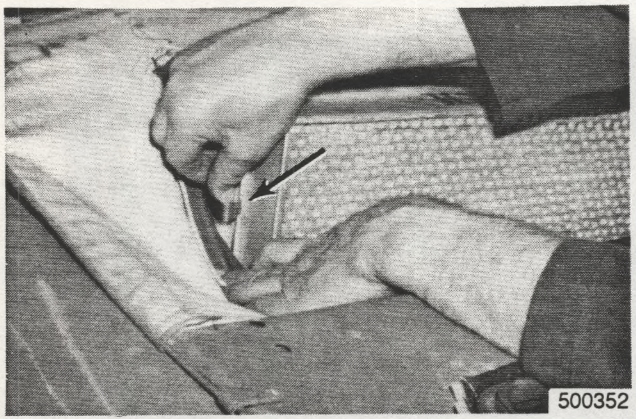


Figure 171: Latch

3. Release the spring retaining clips located on each end of the filter.

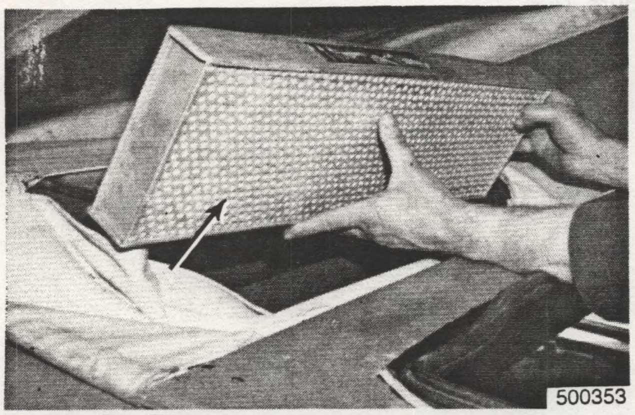


Figure 172: Filter

4. Remove the filter assembly. Tap the filter on a flat surface to shake out and remove the heavy debris. Use compressed air to blow through the filter from the back side (opposite air flow). Inspect the filter for damage. Install the filter in the reverse order of removal.

IMPORTANT: *Be sure to install the filter correctly. The air flow directional arrows must point toward the cab interior.*

Tires and Rims

Check the inflation pressure of the front and rear tires every 125 hours of service (or 3 months). Check the condition of the tires and rims for wear or damage. Keep the tires inflated to the recommended pressures.

NOTE: *See General Specification section of this manual for recommended inflation pressures.*

Visually check the tires daily for damage or noticeably low pressure.

For tires equipped with liquid ballast, use an air-water gauge. The valve stem must be positioned at the bottom to get an accurate reading.

⚠ **CAUTION: A tire can explode during inflation and cause serious injury or death. Replace a wheel rim which has cracks, wear, or severe rust. Never use force on an inflated or partially inflated tire. Be sure the tire is correctly seated on the bead before inflating. Never exceed tire manufacturers maximum recommended inflation pressure.**

When inflating tires, use an air hose with a remote shutoff valve and a "clip-on" air chuck. Stand behind the tread of the tire while inflating and make sure other persons are away from the side of the tire before inflating.

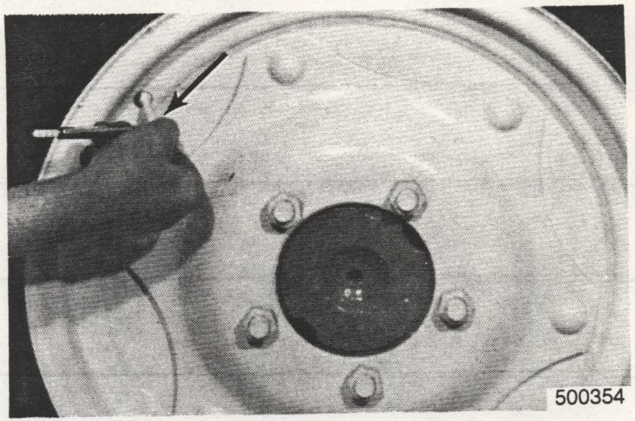


Figure 173:

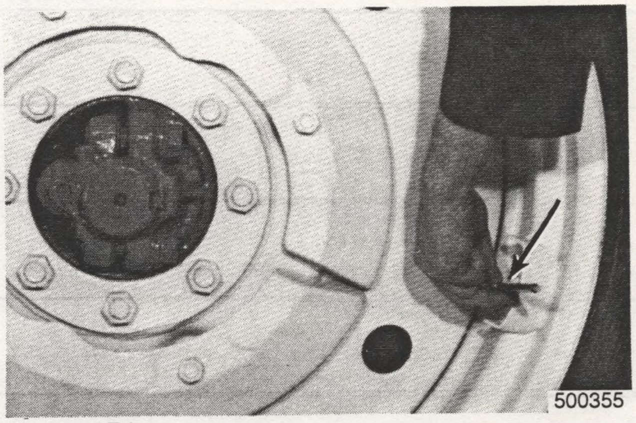


Figure 174:

Wheel Bolt Torque

Tighten the front and rear wheel lug nuts and/or wheel rim bolts to specifications every ten hours for the first 20 hours of operation. Repeat whenever the wheels are removed and remounted. Check the wheel bolt torque every 125 service hours thereafter.

⚠ **CAUTION: Never operate the tractor with a loose wheel or rim.**

Wheel Bolt Torque Specifications:

Front (2WD)	88 - 103 lb ft (120 - 140 Nm)
Front (MFD)	148 - 184 lb ft (200 - 250 Nm)
Rear (All)	190 - 210 lb ft (258 - 285 Nm)

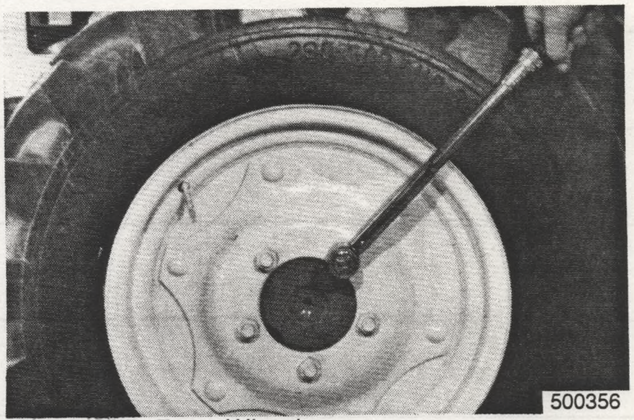


Figure 175: Front Wheel

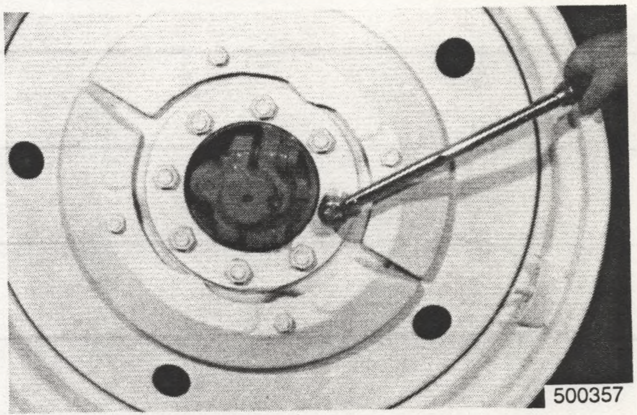


Figure 176: Rear Wheel

NOTES:

Troubleshooting

Troubleshooting

Troubleshooting is an organized study of the problem and a planned method or procedure for investigation and correction of the difficulty. The following pages include some of the problems that an operator may encounter during the service life of the tractor.

The following pages do not give all the answers for correction of problems listed, but are meant to stimulate a train of thought and indicate a work procedure directed toward the source of the trouble.

Think Before Acting

Study the problem thoroughly and ask yourself these questions:

1. What were the warning signs preceding the trouble?
2. What previous repair and maintenance work has been done?
3. Has similar trouble occurred before?
4. If engine still runs, is it safe to continue running it to make further checks?

Do Easiest Things First

Most problems are simple and easily corrected. Examples are "low power" complaints caused by loose throttle linkage or dirty fuel filters' "excessive oil consumption" caused by leaking gaskets or connections, etc.

Always check the easiest and obvious things first. Following this simple rule will save time and trouble.

Double Check Before Beginning Disassembly Operations.

The source of most engine problems can be traced not to one part alone but to the relationship of one part with another. For instance, excessive fuel consumption may not be due to an incorrectly adjusted fuel pump, but instead to a clogged air cleaner or possible restricted exhaust passage causing excessive back pressure. Too often, engines are completely disassembled in search of the cause of a certain complaint and all evidence is destroyed during disassembly operations. Check again to be sure an easy solution to the problem has not been overlooked.

If the hints in this manual do not correct a problem, see your dealer.

Find and Correct Basic Cause of Trouble

After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem so that the same failure will not be repeated. A complaint of "sticking injector plungers" is corrected by replacing the faulty injectors, but something caused those plungers to stick. The cause may be improper injector adjustment or more often water in the fuel.

The following pages list some of the complaints and causes the operator can study to become aware of what might cause the problem when it does arise.

HYDRAULIC SYSTEM TROUBLESHOOTING

PROBLEM: System will not operate, or will not operate under load

Possible Cause	Probable Remedy
1. Pump not engaged	1. Engage pump drive
2. Low oil level	2. Fill with oil
3. Bypass valve stuck	3. Clean, polish or replace pin valve
4. Pressure relief valve dirty, damaged or out of adjustment	4. Clean, inspect or adjust as required
5. Faulty hydraulic pump	5. Repair or replace pump

PROBLEM: System fails to operate in one direction or operates slowly in one direction

Possible Cause	Probable Remedy
1. Cylinder limit collar out of adjustment	1. Adjust and tighten limit collar
2. Loose quick coupler causing check balls not to unseat	2. Tighten quick coupler
3. Weak quick coupler spring causing one check ball to remain seated	3. Replace with matched set of springs
4. Bad cylinder packing	4. Replace cylinder packing
5. Wrong grade of oil for cold weather operation	5. Install proper grade of oil. (Bypass the oil for several minutes to allow oil to warm)

PROBLEM: Control lever will not or slowly picks up 3-point hitch

Possible Cause	Probable Remedy
1. Low oil level	1. Fill with oil
2. Plugged bypass or pressure relief valve	2. Remove and clean bypass or pressure relief valve

PROBLEM: 3-Point Hitch will not lower using control lever

Possible Cause	Probable Remedy
1. Blockage in return line	1. Remove and clear or replace return line

PROBLEM: Hitch will not lower using either control handles

Possible Cause	Probable Remedy
1. Drop retard valve plugged (end of cylinder lift hose)	1. Clean or replace drop retard valve
2. Hitch linkage froze at bearing blocks	2. Free up bearing blocks and lubricate

PROBLEM: Hitch leaks down

Possible Cause	Probable Remedy
1. Low hydraulic pressure	1. Clean and inspect the bypass and/or pressure relief valve
2. External hydraulic connections leaking	2. Tighten and/or repair connecting as required
3. Hitch cylinder packing bad	3. Repair or replace hitch cylinder
4. Hitch control valve internal leak	4. Repair or replace hitch control valve
5. Low hydraulic oil level	5. Fill with oil to the proper level

HYDRAULIC SYSTEM TROUBLESHOOTING
(Continued)

PROBLEM: Remote cylinder leaks down

Possible Cause	Probable Remedy
1. Hydraulic couplers leaking	1 Clean, tighten or replace couplers
2. Control valve spool leakage through self cancel system	2. Remove, clean and repair control valve
3. Remote cylinder packings bad	3. Repair or replace remote cylinder
4. Low hydraulic oil level	4. Fill with oil to the proper level

PROBLEM: No hitch down pressure

1. Low hydraulic oil level	1. Fill with oil to the proper level
2. Dirty or restricted bypass or pressure relief valve	2. Clean and adjust as needed
3. Dirty hydraulic filter	3. Clean or replace filter
4. Restricted retard valve on hydraulic cylinder	4. Clean or replace the retard valve
5. External hydraulic leaks	5. Tighten or repair leaks as required
6. Pin valve on cylinder stuck	6. Remove and clean pin valve

PROBLEM: Hydraulic system overheats

1. Control levers binding and not returning to neutral	1. Disassemble, clean and lubricate the control levers
2. Relief valve faulty, plugged or out of adjustment	2. Repair, adjust or replace the pressure relief valve
3. Crossed hydraulic lines creating back pressure	3. Reroute hydraulic lines properly

PROBLEM: Pressure/Volume loss when warm, cold operation fine

1. Wrong oil viscosity or diluted hydraulic oil	1. Change hydraulic oil to correct viscosity
2. Hydraulic pump bearings failed causing internal leakage	2. Repair or replace hydraulic pump
3. Remote system internal leakage	3. Repair leakage or replace damaged components

PROBLEM: Hitch system doesn't work

1. Bypass and/or pressure relief valve contaminated	1. Remove, clean or repair bypass and/or relief valve
2. Flow divider valve plugged or faulty (power steering equipped only)	2. Remove, clean or replace flow divider
3. Hitch cylinder internal leakage	3. Remove, repair or replace the hitch cylinder
4. Low hydraulic oil level	4. Fill hydraulic tank to proper level
5. Hydraulic pump disengaged	5. Engage hydraulic pump
6. Hydraulic pump engagement fork out of adjustment or broke	6. Adjust or replace the pump engagement fork

ELECTRICAL SYSTEM TROUBLESHOOTING

PROBLEM: Starting motor will not crank

Possible Cause	Probable Remedy
1. Battery cables dirty or faulty	1. Clean, tighten or replace battery cables
2. Batteries discharged or faulty	2. Charge or replace batteries
3. Ground lockout switch open or faulty	3. Turn on or clean mount bolts. Replace if faulty
4. Neutral start switch misadjusted, or loose connections	4. Adjust, and/or clean and tighten connections
5. Netural start switch linkage broken or stuck	5. Check, clean and lubricate linkage ball end
6. Starter solenoid connections dirty or loose	6. Clean, tighten or replace connections
7. RS502 starter relay out of adjustment or faulty	7. Clean, adjust or replace RS502 starter relay
8. Start key switch connections dirty or loose	8. Check, clean and tighten key switch connectors
9. Dirty or faulty key switch	9. Lubricate switch with WD40 or replace
10. Starter mount bolts loose (poor ground between frame and starter)	10. Clean and tighten starter mount bolts
11. Engine mechanically stuck	11. Repair or replace the engine

PROBLEM: Starter engages but engine turns slow

1. Battery connections corroded or loose	1. Clean, tighten or replace cables
2. Batteries discharged	2. Check, battery condition, charge or replace
3. Solenoid connections loose or broken	3. Check, clean and tighten starter solenoid connections
4. Starter mount bolts loose	4. Tighten mount bolts
5. Starter solenoid to starter field strap connection corroded or loose	5. Clean and tighten starter field strap
6. Engine oil viscosity too heavy for season	6. Change oil to correct seasonal viscosity
7. Faulty key switch and/or connections	7. Repair or replace key switch or connections
8. Engine flooded or mechanically stuck	8. Remove injectors, rotate engine until flooding clears. Repair reason for flooding.
9. Faulty starter motor	9. Remove and bench check starter. Repair or replace starter as required
10. Faulty flywheel ring gear	10. Replace ring gear if faulty

PROBLEM: Starter engages but will not crank engine

1. Battery cables dirty or loose	1. Clean, tighten or replace cables
2. Battery discharged or faulty	2. Charge or replace batteries
3. Faulty starter or starter switch	3. Remove starter, bench check and repair or replace as required
4. Loose or faulty flywheel ring gear	4. Remove and replace ring gear
5. Engine mechanically stuck	5. Repair engine

ELECTRICAL SYSTEM TROUBLESHOOTING (Continued)

PROBLEM: Starter engages as soon as the ground lockout switch is closed

Possible Cause	Probable Remedy
1. Faulty key switch	1. Replace key switch
2. Starter solenoid terminals making contact internally	2. Repair or replace starter solenoid
3. Faulty RS502 starter relay	3. Adjust or replace RS502

PROBLEM: Red indicator lamp stays illuminated when tractor is running

1. Loose or broken fan/alternator belt	1. Adjust or replace the fan/alternator belt
2. Faulty voltage regulator	2. Replace regualtor
3. Faulty alternator	3. Repair or replace alternator

PROBLEM: Red indicator lamp stays on when engine is stopped and ground lockout switch open

1. Battery hold down contacting against battery terminal	1. Adjust battery hold down
2. Battery cables grounding against tractor frame	2. Adjust or replace cables
3. Trouble light plug grounding against frame	3. Disconnect or remove the trouble light plug

PROBLEM: Batteries will not charge

1. Battery cables dirty, loose or faulty	1. Clean, tighten or replace the battery cables
2. Battery electrolite level too low	2. Fill batteries to proper level
3. Faulty batteries	3. Load check and test batteries, replace if faulty
4. Faulty ground lockout switch	4. Replace lockout switch
5. Loose fan/alternator belt	5. Adjust belt to 1/2 inch deflection
6. Loose ground lockout switch connections	6. Clean and tighten bolts
7. Faulty regulator	7. Replace regulator
8. Faulty or misadjusted RS502 relay	8. Adjust or replace RS502 relay
9. Poor connection at ammeter gauge	9. Clean and tighten connections
10. Faulty ammeter gauge	10. Replace gauge

PROBLEM: Glow plugs will not operate

1. Indicator lamp burned out	1. Replace indicator lamp
2. Open circuit or loose connections at indicator lamp, key switch, flow plug or resistor	2. Check, clean, tighten or replace as required
3. Poor ground at glow plug	3. Remove, clean and replace glow plug
4. Burned out resistor	4. Replace resistor

ELECTRICAL SYSTEM TROUBLESHOOTING
(Continued)

PROBLEM: Turn signals will not operate

	Possible Cause		Probable Remedy
1.	Blown fuse	1	Replace fuse wire
2.	Poor ground at lamps	2.	Clean and tighten lamp mounting
3.	Faulty flasher	3.	Replace flasher
4.	Burned out bulbs	4.	Replace bulbs
5.	Loose connection in junction box	5.	Remove junction box cover, clean and tighten connections
6.	Loose or dirty harness connector	6.	Clean and tighten connector

PROBLEM: Head lamps and/or work lamps will not work

1.	Blown fuse	1.	Replace fuse strip wire
2.	Burned out lamp bulbs	2.	Replace faulty bulbs
3.	Poor ground connection	3.	Check, clean and tighten
4.	Faulty light plug	4.	Repair or replace light plug
5.	Faulty switch	5.	Repair or replace switch
6.	Loose or open circuit in lamps, terminal block or wire harness	6.	Locate and correct loose or open circuit

PROBLEM: Horn does not work

1.	Blown fuse	1.	Replace fuse strip wire
2.	Faulty wire connection	2.	Clean and tighten connections
3.	Poor ground	3.	Remove horn, clean contact surface and tighten horn
4.	Key not inserted fully in switch	4.	Install key fully into switch
5.	Faulty horn switch	5.	Repair horn switch
6.	Faulty horn	6.	Replace horn assembly

ENGINE FUEL SYSTEM TROUBLESHOOTING

PROBLEM: Engine runs rough

	Possible Cause		Probable Remedy
1.	Air in fuel system	1	Bleed and prime fuel system
2.	Dirt under primer pump poppet valve	2.	Remove and clean poppet valve
3.	Valves out of adjustment	3.	Adjust valves to specifications
4.	Faulty injector	4.	Repair or replace injector(s)
5.	Faulty head gasket	5.	Replace head gasket
6.	Engine out of time	6.	Time engine to specifications
7.	Faulty primer pump	7.	Replace primer pump

PROBLEM: Engine overheats

1.	Fan belt loose	1.	Adjust or replace belt to 1/2 inch deflection
2.	Plugged cooling fins	2.	Remove shroud and clean cooling fins
3.	Engine overloaded	3.	Reduce load or drop down a gear
4.	Wrong fuel grade for season	4.	Use proper grade fuel
5.	Wrong grade engine oil for season	5.	Change to proper oil grade for season
6.	Low engine oil level	6.	Fill crankcase to correct level
7	Blower bearing defective	7.	Replace blower bearing
8.	Engine overfueling	8.	Remove and calibrate fuel injection pump
9.	Faulty fuel injectors	9.	Repair or replace injectors

PROBLEM: The tractor will not start

1.	Fuel tank empty	1.	Fill fuel tank to proper level
2.	Air in fuel delivery system	2.	Bleed fuel system
3.	Clogged fuel filters	3.	Clean and/or replace the fuel filters. Bleed fuel system
4.	Dirt under the prime pump poppit valve	4.	Remove, clean, reinstall the poppet valve, bleed fuel system
5.	Restricted fuel tank vent hose	5.	Remove and clear the vent hose
6.	Restricted fuel return line	6.	Remove, clean and reinstall the return line
7.	Water in fuel system	7.	Drain fuel tank and filters, add fresh fuel and fuel conditioner
8.	Fuel tank screen plugged	8.	Remove and clean screen
9.	Faulty primer pump	9.	Replace the primer pump
10.	Faulty or plugged fuel injectors	10.	Remove clean, test or replace fuel injectors
11.	Governor stuck	11.	Remove cover, check and lubricate
12.	Fuel delivery valve springs jammed or broken	12.	Remove cover free up, lubricate or replace springs
13.	Engine out of time	13.	Retime engine
14.	Fuel delivery valves plugged	14.	Remove and clean
15.	Faulty fuel pump	15.	Repair or replace the fuel pump

ENGINE FUEL SYSTEM TROUBLESHOOTING
(Continued)

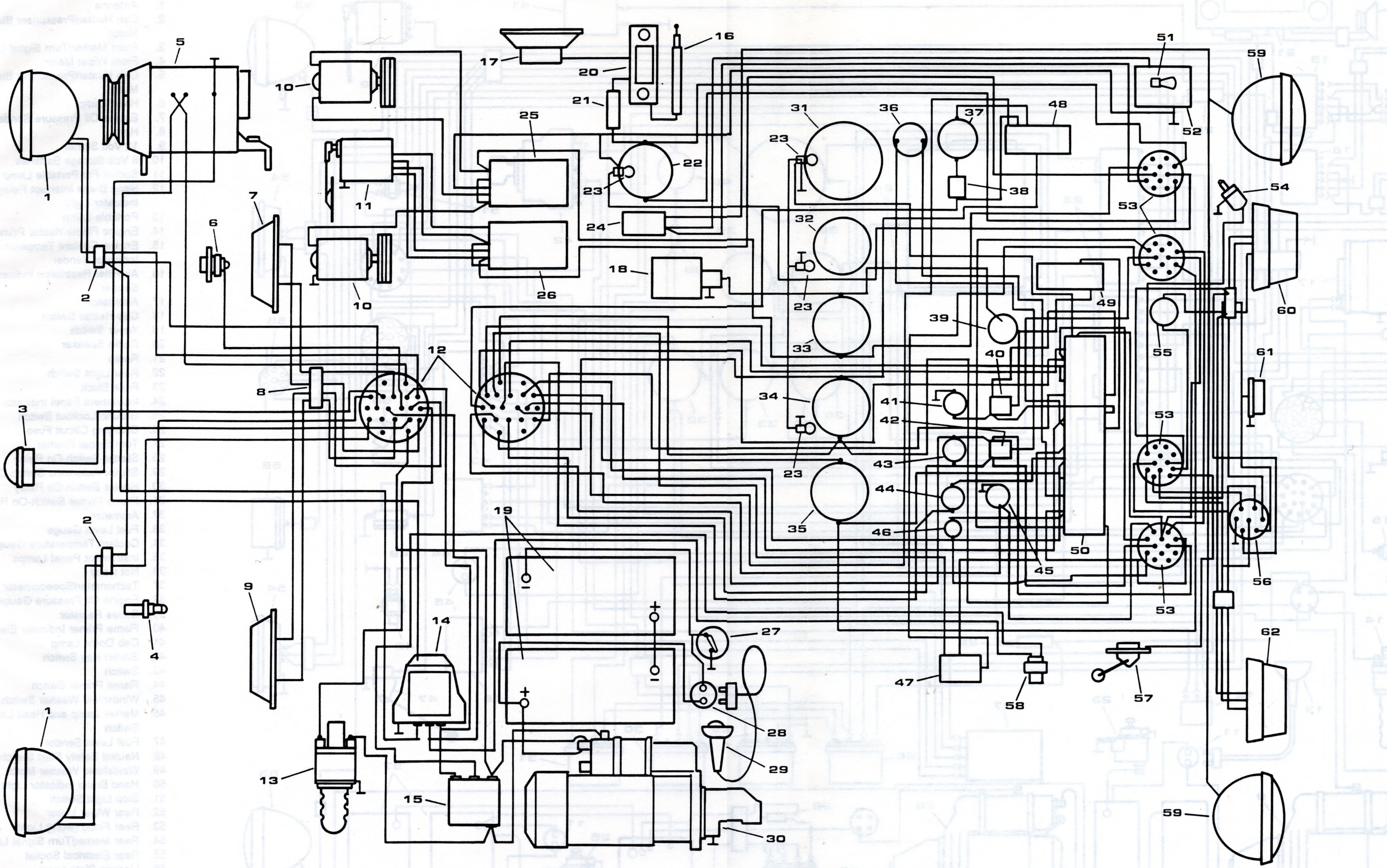
PROBLEM: Tractor runs but loses power under load

Possible Cause	Probable Remedy
1. Dirty fuel filters	1 Clean and/or replace filters
2. Dirty air cleaner	2. Clean oil bath air cleaner
3. Air in fuel system	3. Bleed and prime fuel system
4. Poor quality fuel	4. Drain and refill fuel tank with fresh fuel of proper type
5. Fuel pump calibration wrong	5. Have fuel pump calibrated
6. Faulty primer pump	6. Replace primer pump
7. Dirt under primer pump poppet	7. Remove and clean poppet
8. Governor sticking	8. Remove cover, clean and lubricate
9. Dirty or faulty injectors	9. Repair or replace injectors
10. Faulty fuel pump	10. Repair or replace fuel pump

PROBLEM: Fuel system will not prime

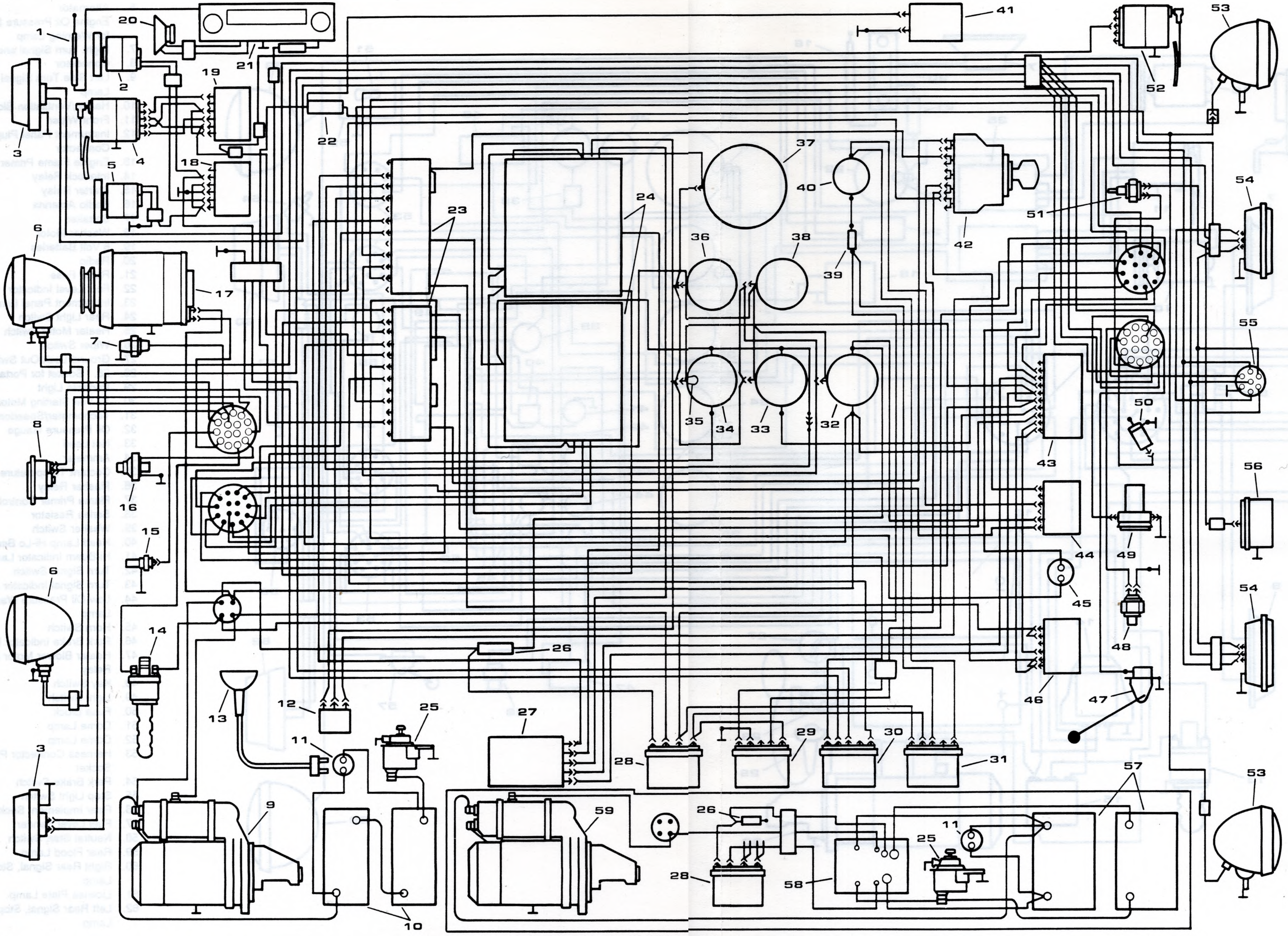
1. Fuel shut off valve closed	1. Open valve
2. Fuel tank vent plugged	2. Clean vent
3. Fuel tank screen plugged	3. Remove and clean screen
4. Air leak in connections	4. Check and tighten connections
5. Restricted fuel line	5. Remove and clean fuel line
6. Dirt under primer pump poppet valve	6. Remove and clean poppet valve
7 Leak in fuel system	7. Repair leak
8. Faulty primer pump	8. Replace primer pump

WIRING SCHEMATIC
500, 800 and 900 Series Tractors with Steel Style Instrument Panel and Cab



1. Hi-Lo Beam Head Lamp
2. Connector
3. Horn
4. Engine Coolant Temperature Sender
5. Alternator
6. Engine Oil Pressure Drop Sender for Warning Lamp
7. Right Turn Signal and Marker Lamp
8. Connector
9. Left Side Turn Signal and Marker Lamp
10. Heater/Ventilation Blower Motor
11. Front Wiper
12. Instrument Panel Plug and Socket Connector
13. Engine Flame Primer
14. Interlock Relay
15. Starter Relay
16. Radio Antenna
17. Speaker
18. Washer Motor
19. 6 Volt Batteries
20. Radio
21. Radio Fuse
22. Fuel Level Indicator
23. Instrument Panel Lamp
24. Rear Light Switch
25. Heater Motor Switch
26. Wiper Switch
27. Ground Lock-Out Switch
28. 28. Socket for Portable Light
29. Portable Light
30. 12 Volt Starting Motor
31. Tachometer/Speedometer
32. Oil Pressure Gauge
33. Not used
34. Ammeter
35. Coolant Temperature Gauge
36. Flasher Relay
37. Flame Primer Control
38. Series Resistor
39. Washer Switch
40. Head Lamp Hi-Lo Beam Switch
41. Hi Beam Indicator Lamp
42. Turn Signal Switch
43. Turn Signal Indicator Lamp
44. Low Oil Pressure Warning Indicator Lamp
45. Horn Switch
46. Park Brake Indicator Lamp
47. Heater Blower Motor Interlock Relay
48. Key Switch
49. Light Switch
50. Fuse Block
51. Dome Lamp
52. Dome Lamp
53. Harness Connector Plug and Socket
54. Park Brake Switch
55. Stop Light Switch
56. Rear Implement Socket
57. Fuel Level Sender
58. Neutral Start Switch
59. Rear Flood Lamp
60. Right Rear Signal, Stop and Marker Lamp
61. License Plate Lamp
62. Left Rear Signal, Stop, and Marker Lamp

WIRING SCHEMATIC
500, 800 and 900 Series Tractors with Moulded Fiberglass Style Instrument Panel and Cab



1. Antenna
2. Cab Heater/Pressurizer Blower Motor
3. Front Marker/Turn Signal Lamps
4. Front Wiper Motor
5. Cab Heater/Pressurizer Blower Motor
6. Head Lamp
7. Engine Oil Pressure Sender
8. Horn
9. 12 Volt Starter
10. 6 Volt Storage Batteries
11. Socket For Portable Lamp
12. Hand Brake Interrupt Relay for Indicator Light
13. Portable Lamp
14. Engine Flame Heater Primer
15. Engine Coolant Temperature Indicator Sender
16. Air Filter Restriction Indicator Sender
17. Alternator
18. Cab Heater Switch
19. Wiper Switch
20. Radio Speaker
21. Radio
22. Rear Light Switch
23. Fuse Block
24. Instrument Panel Indicator Lights
25. Ground Lockout Switch
26. Charging Circuit Fuse
27. Turn Signal Flasher
28. Starter Switch-On Relay
29. Starter Automatic Switch-Off Relay
30. Heater Switch-On Relay
31. Flame Primer Switch-On Relay
32. Ammeter
33. Fuel Level Gauge
34. Coolant Temperature Gauge
35. Instrument Panel Lamps
36. Not Used
37. Tachometer/Speedometer
38. Engine Oil Pressure Gauge
39. Series Resistor
40. Flame Primer Indicator Element
41. Cab Dome Lamp
42. Starter Key Switch
43. Switch
44. Flame Primer Switch
45. Windshield Washer Switch
46. Marker Lamp and Head Lamp Switch
47. Fuel Level Sender
48. Neutral Safety Start Switch
49. Windshield Washer Motor
50. Hand Brake Indicator Light Switch
51. Stop Light Switch
52. Rear Wiper Motor
53. Rear Flood (work) Lights
54. Rear Marker/Turn Signal Lamps
55. Rear Electrical Socket
56. License Plate Lamp
57. 12 Volt Storage Batteries
58. Battery Switch
59. 24 Volt Starter

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P/N 904805
Issued August, 1992

Printed in the U.S.A.